

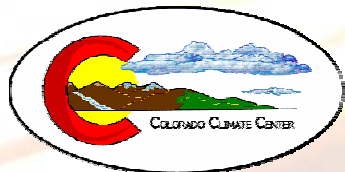
Colorado Climate What Road Are We On?

Nolan Doesken, State Climatologist
Colorado Climate Center

Presented to: Colorado Conservation Tillage Association,
Greeley, CO, January 30, 2007

<http://ccc.atmos.colostate.edu>

Prepared by Odie Bliss



A photograph of a residential street completely covered in snow. A path has been cleared through the center of the road, showing the underlying pavement and some patches of grass. The snow is piled up on both sides of the path, forming high banks. In the background, a white pickup truck is parked on the right side of the road. The scene is set in a winter environment with bare trees and a clear sky.

**Interesting weather
we've been having lately**

Colorado Snowcover as seen from space

Wyoming

Colorado

Nebraska

— Denver

Kansas

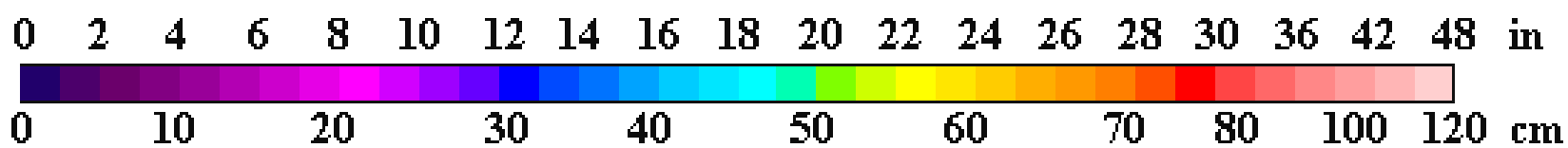
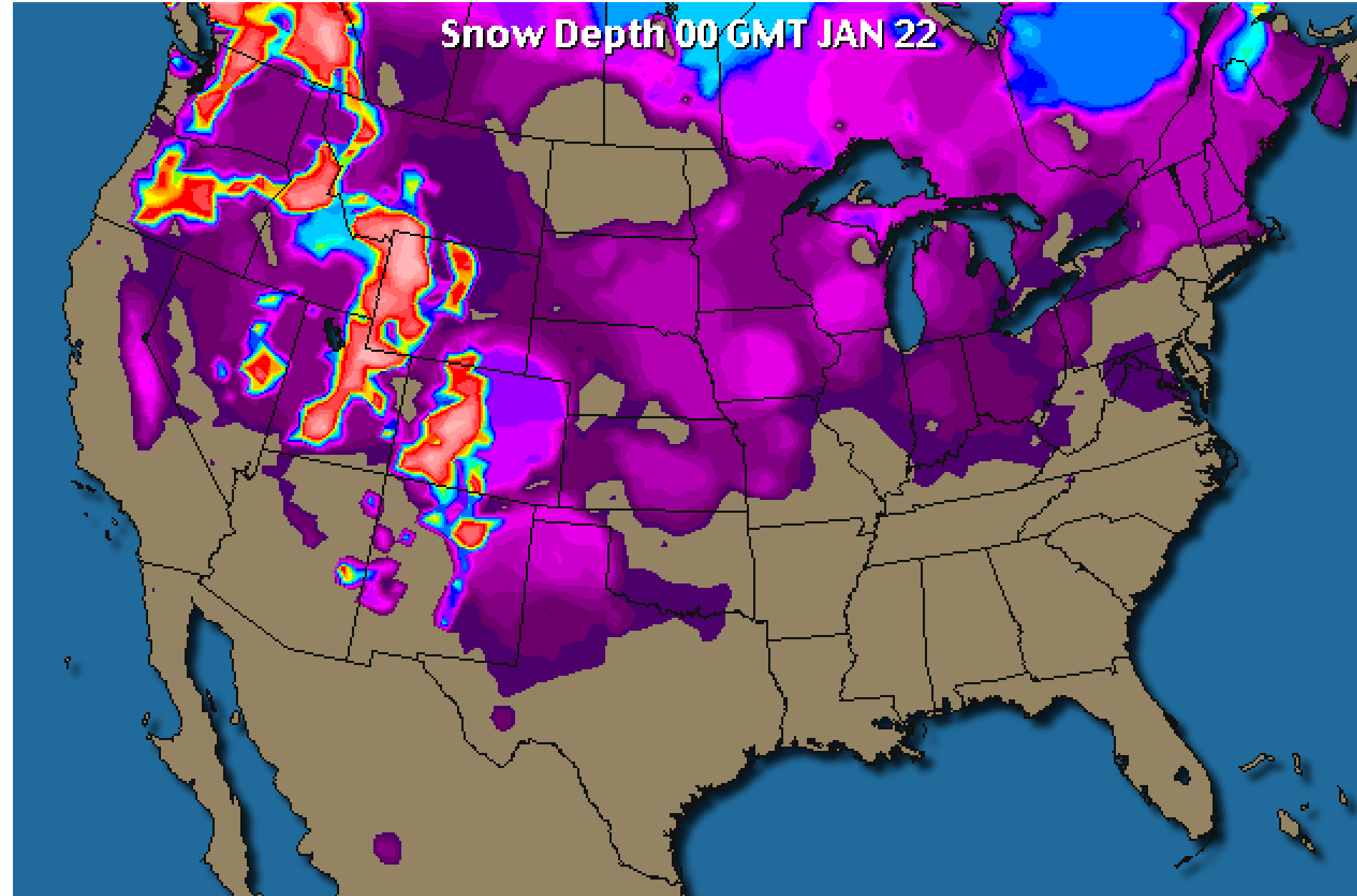
Arkansas River

As of January 7, 2007

50 km

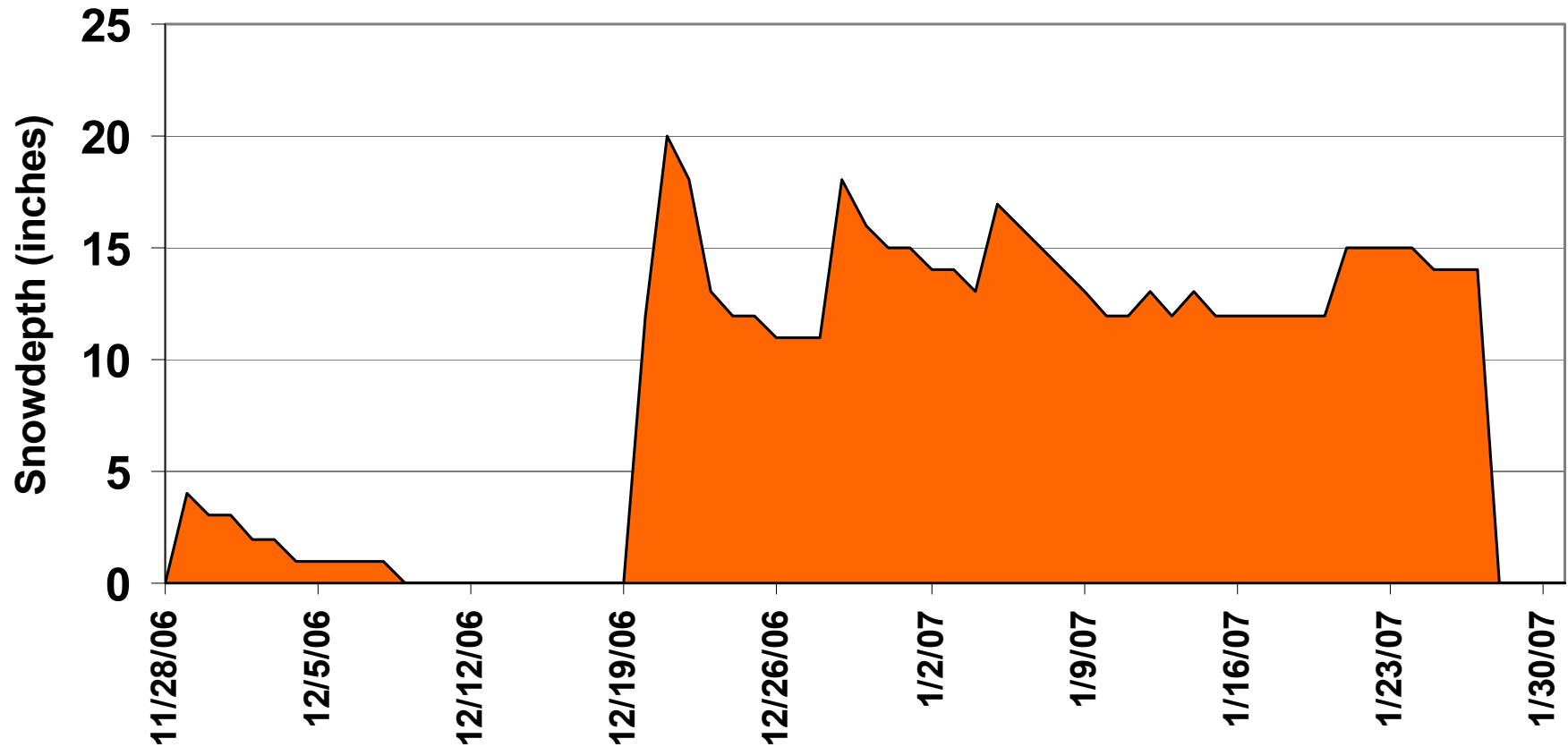


Snow Depth 00 GMT JAN 22



Greeley Daily Total Snowdepth

Greeley Snowdepth
from November 28, 2006 - January 27, 2007

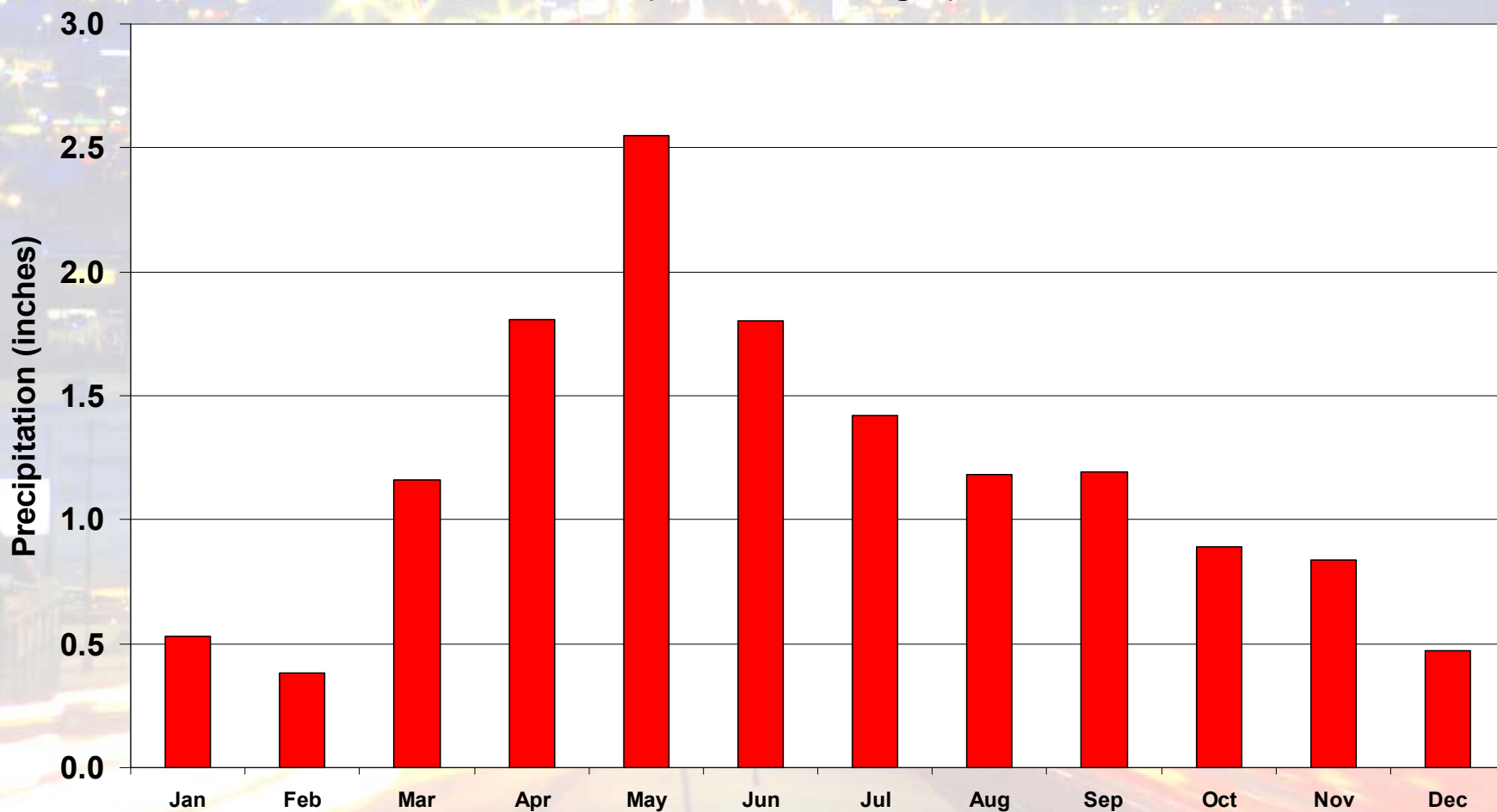


What is our Climate supposed
to be like?



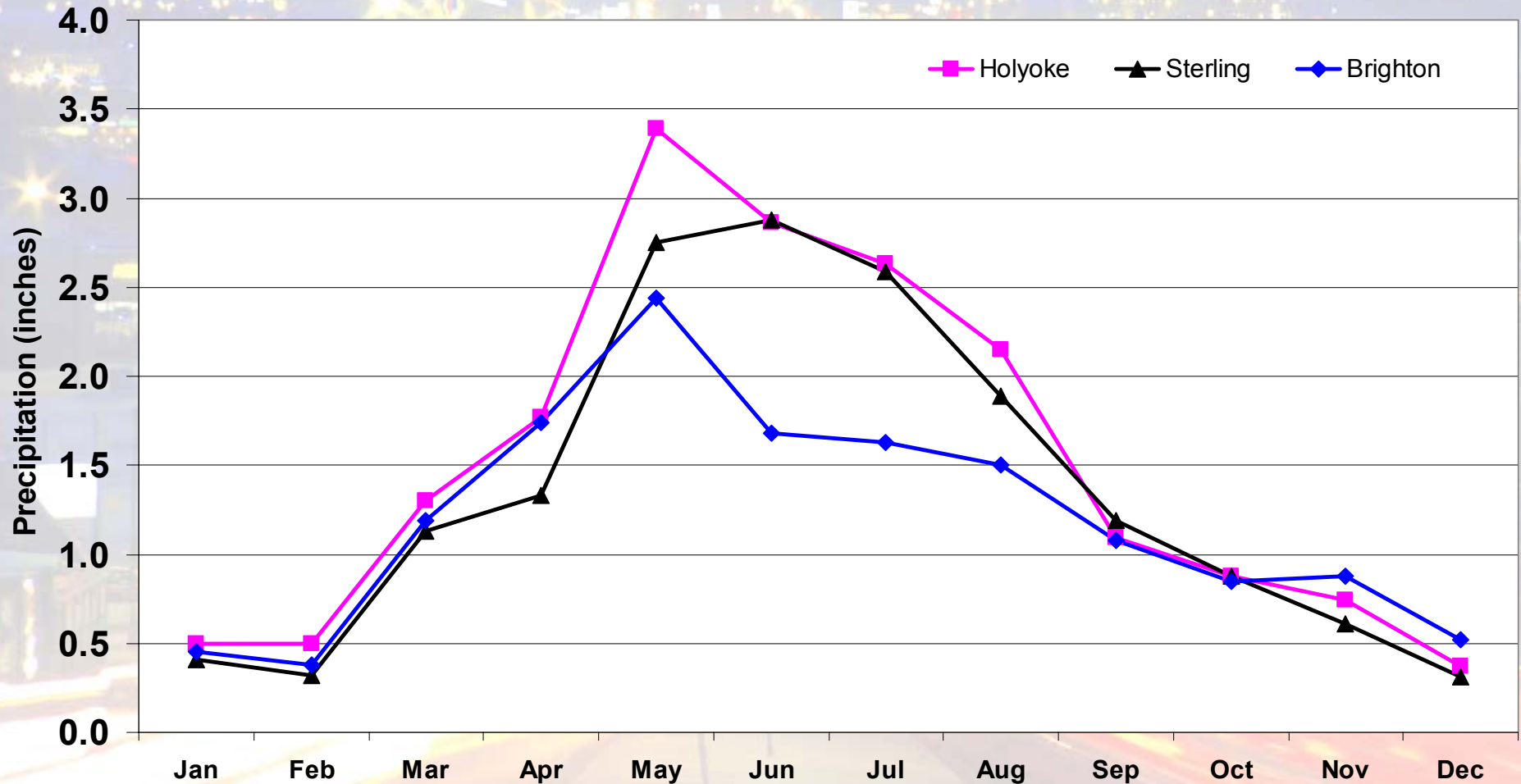
Monthly Average 30-year Precipitation for Greeley, CO

**Monthly Precipitation Averages for Selected Sites
(1971-2000 averages)**



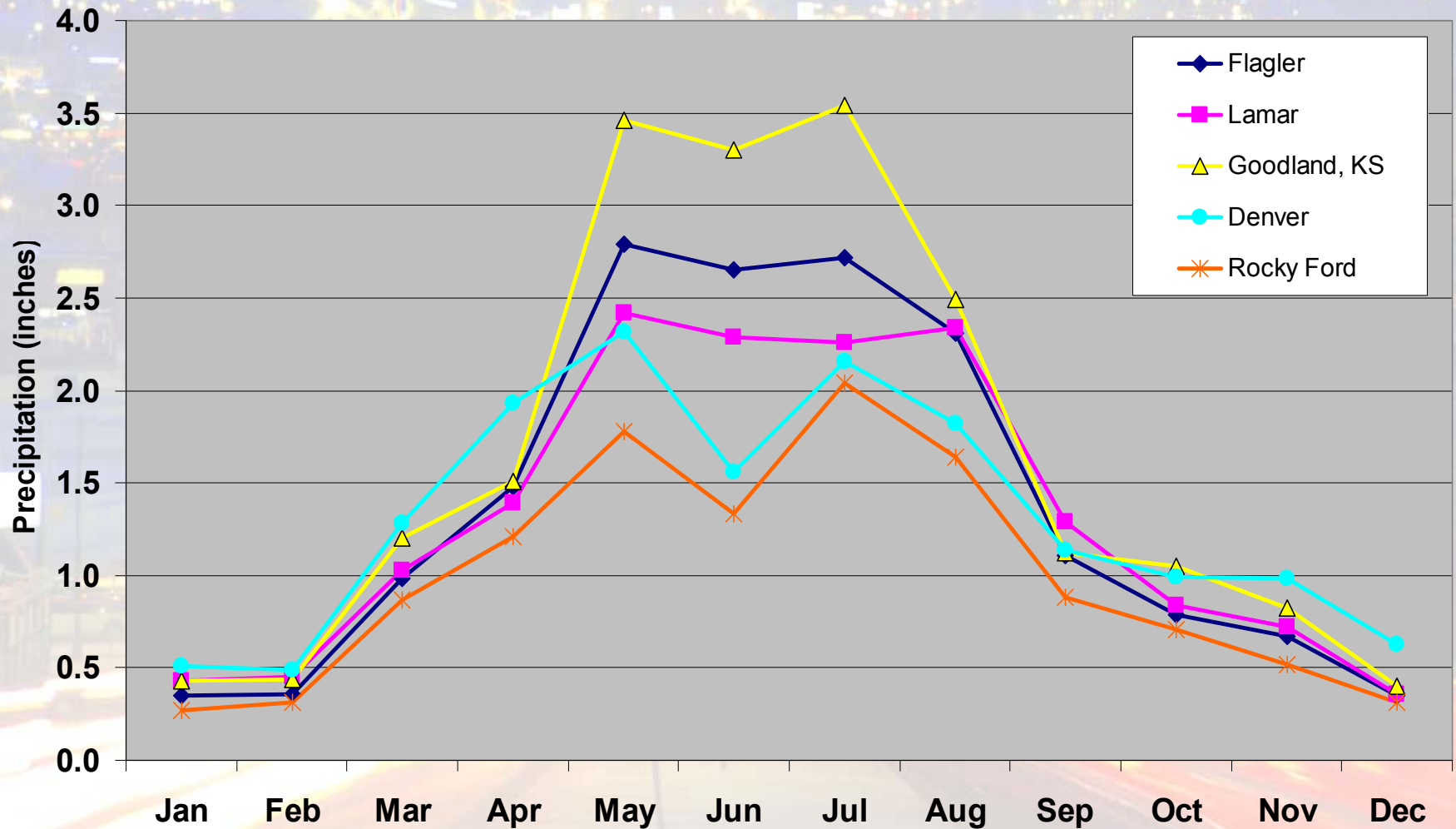
Monthly Average 30-year Precipitation for Brighton, Sterling and Holyoke, CO

Monthly Precipitation Averages for Selected Sites
(1971-2000 averages)

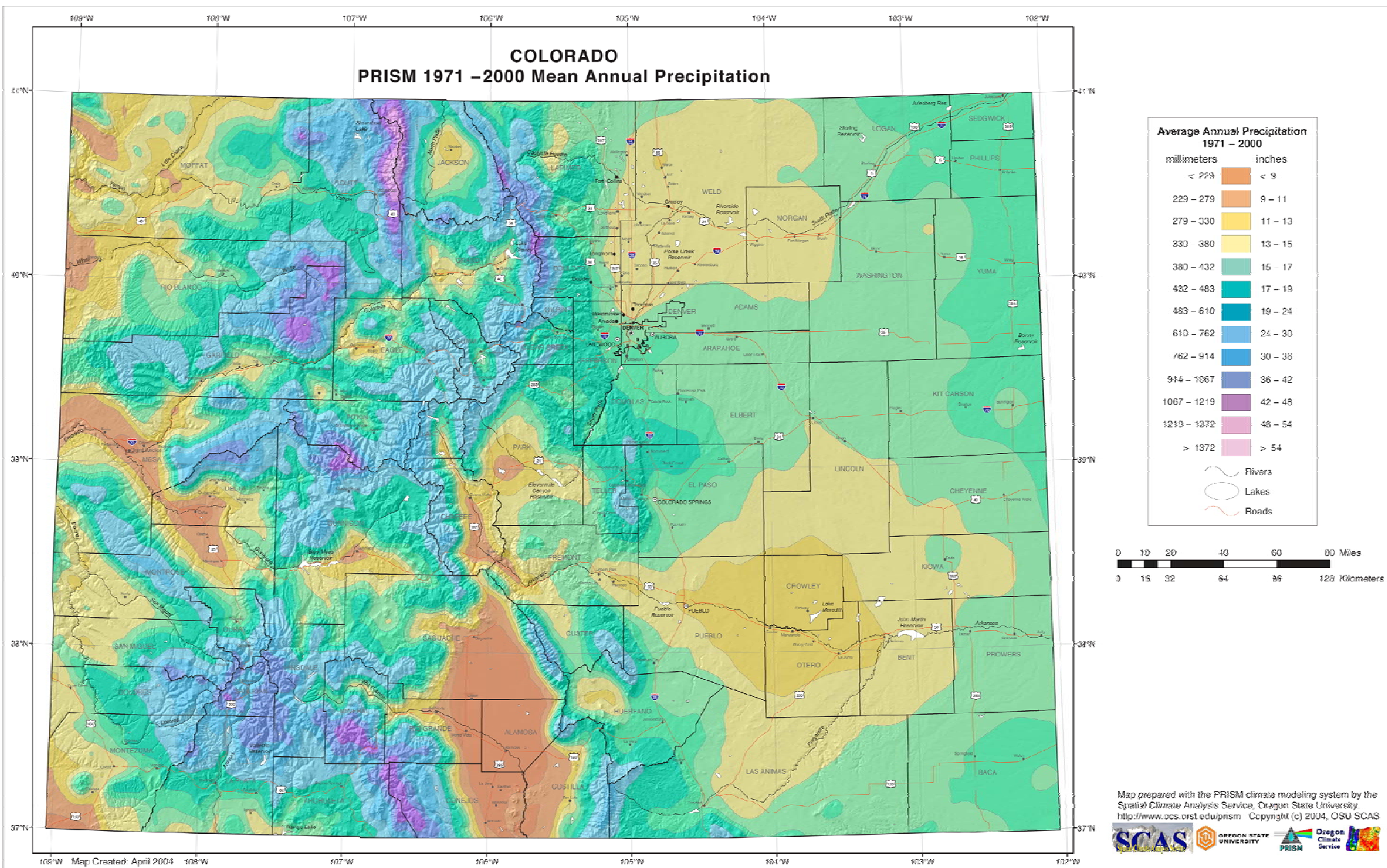


Precipitation Averages for Selected Sites

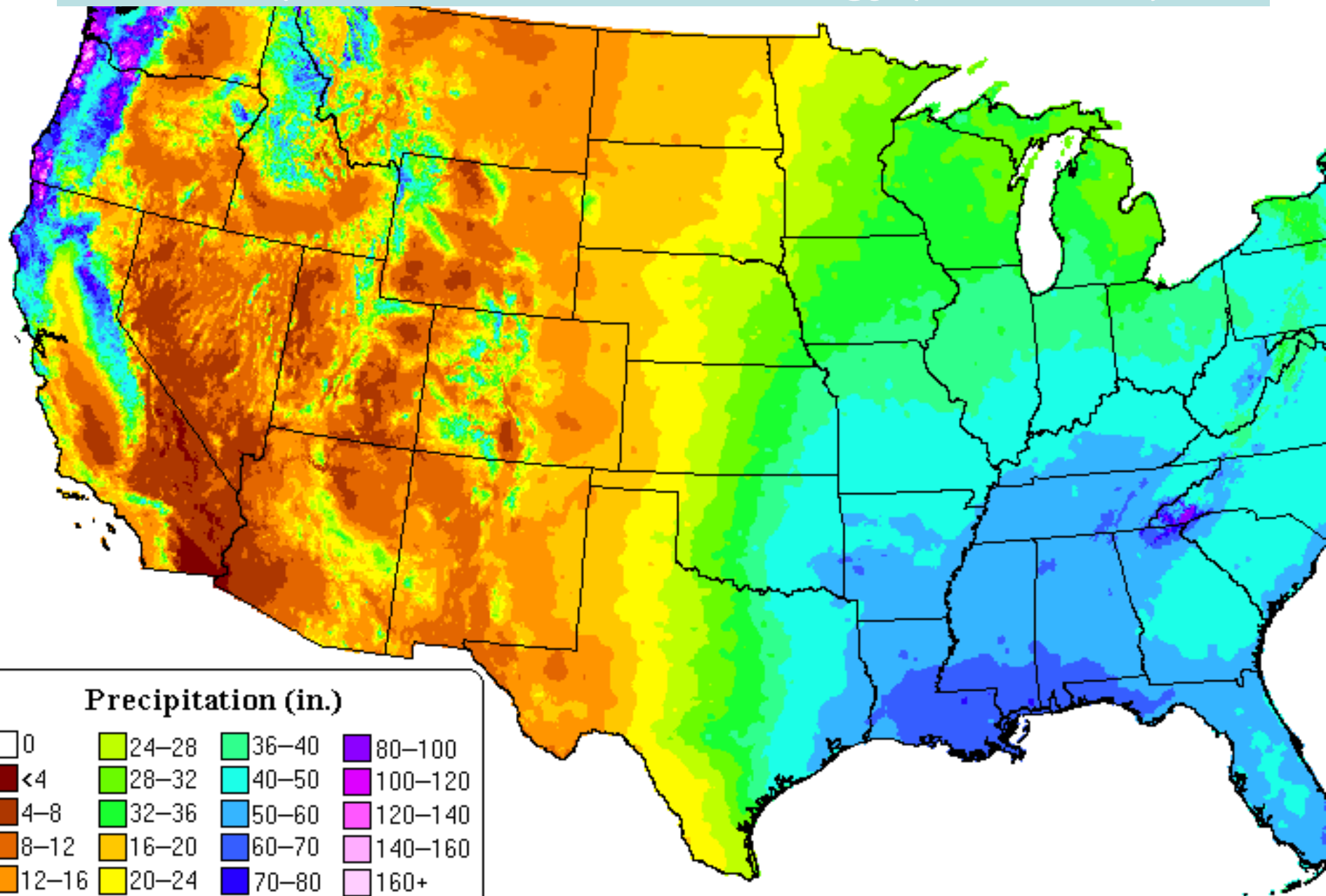
Comparison Monthly Precipitation for Selected Sites
(1971-2000 averages)



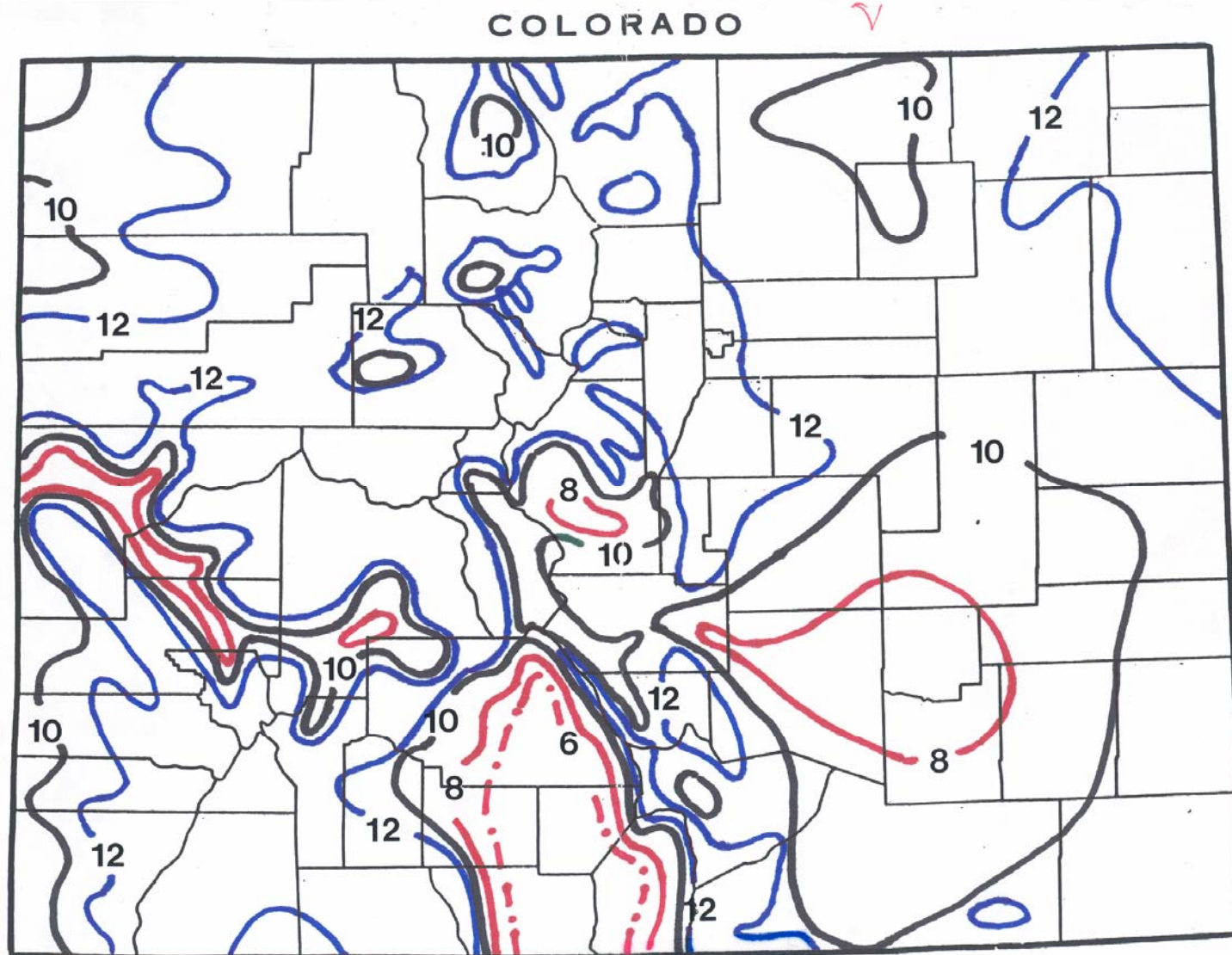
Colorado Average Annual Precipitation



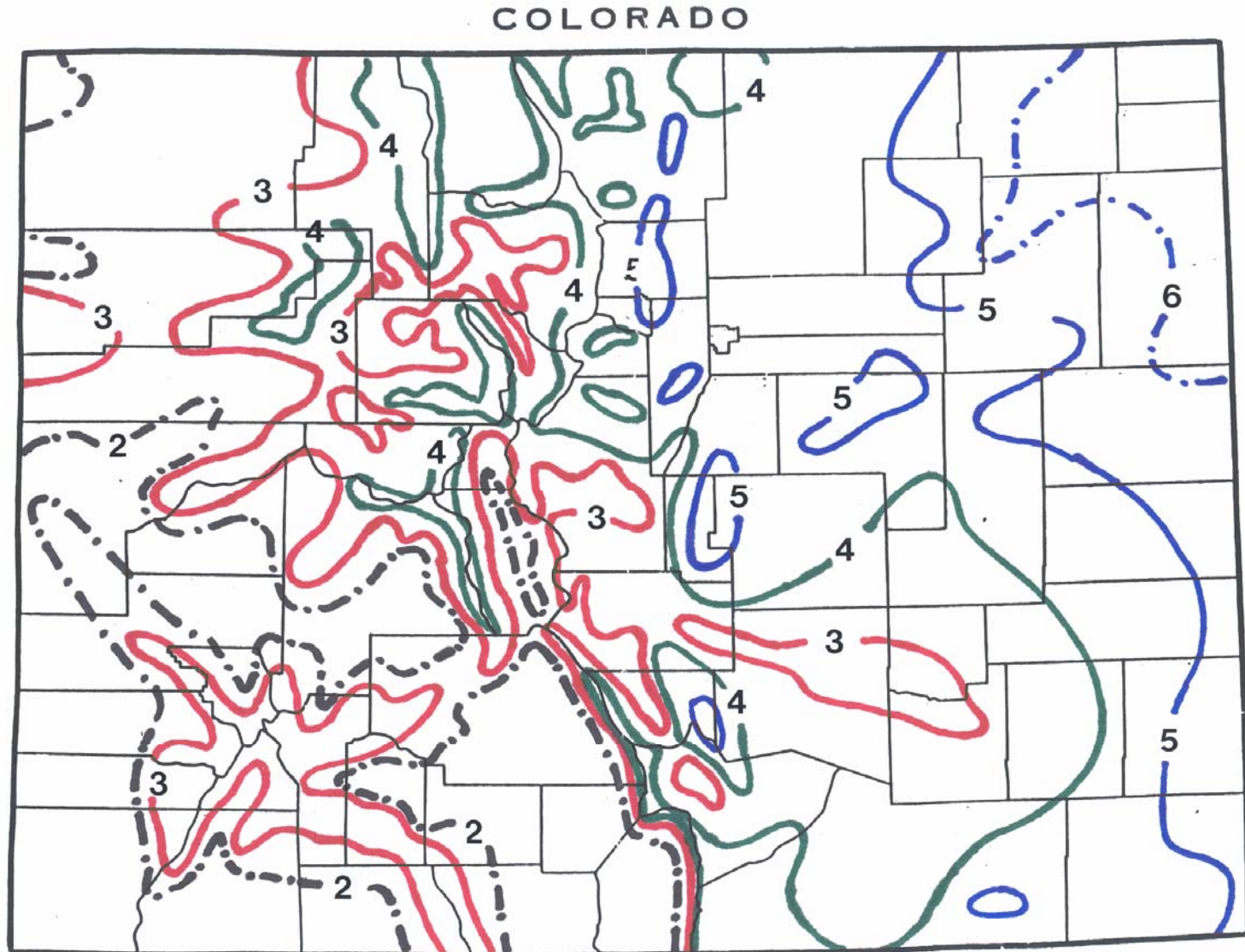
Precipitation: Annual Climatology (1971-2000)



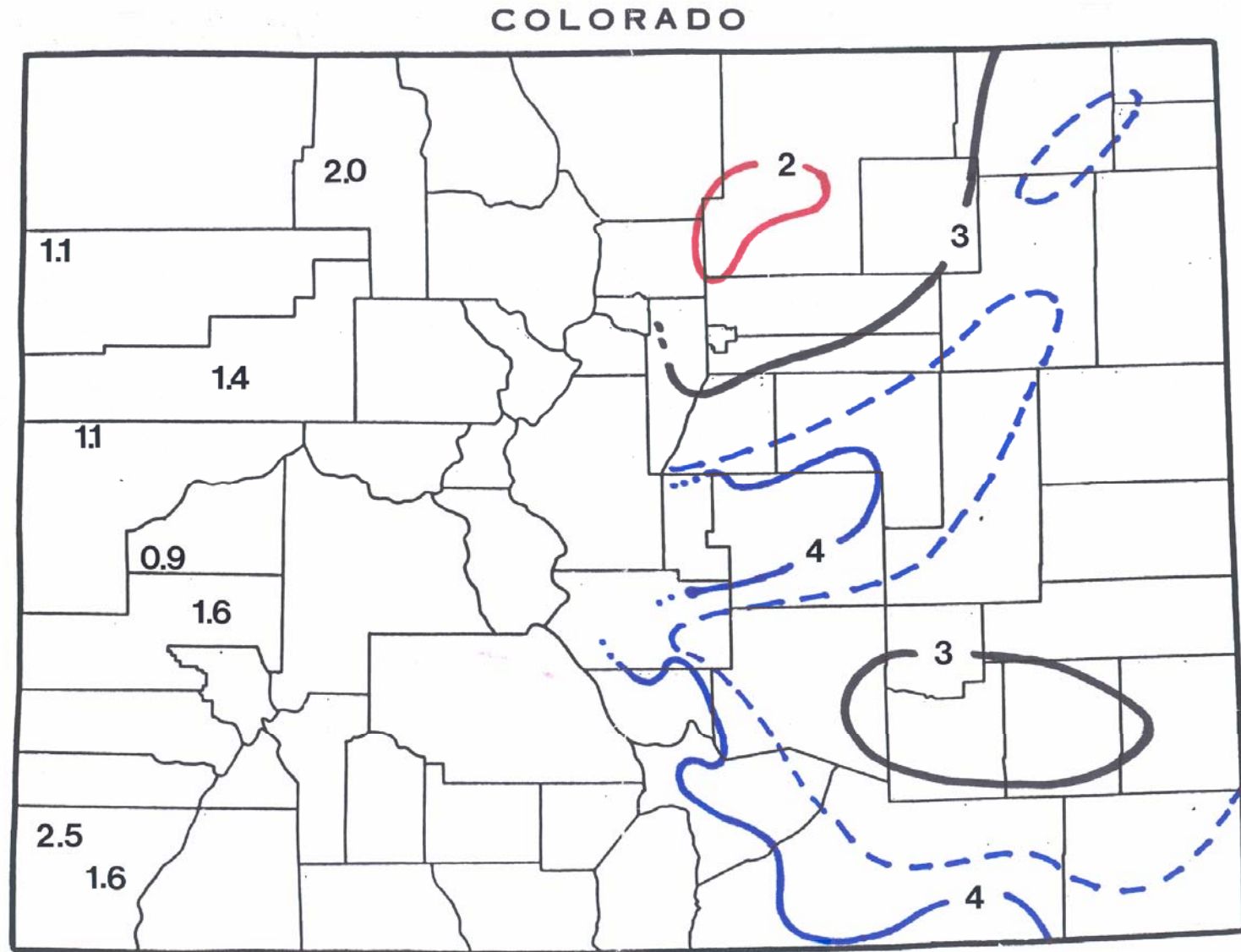
Average Wheat-Season Precipitation September – June (Inches) (Based on 1961-90 observed data)

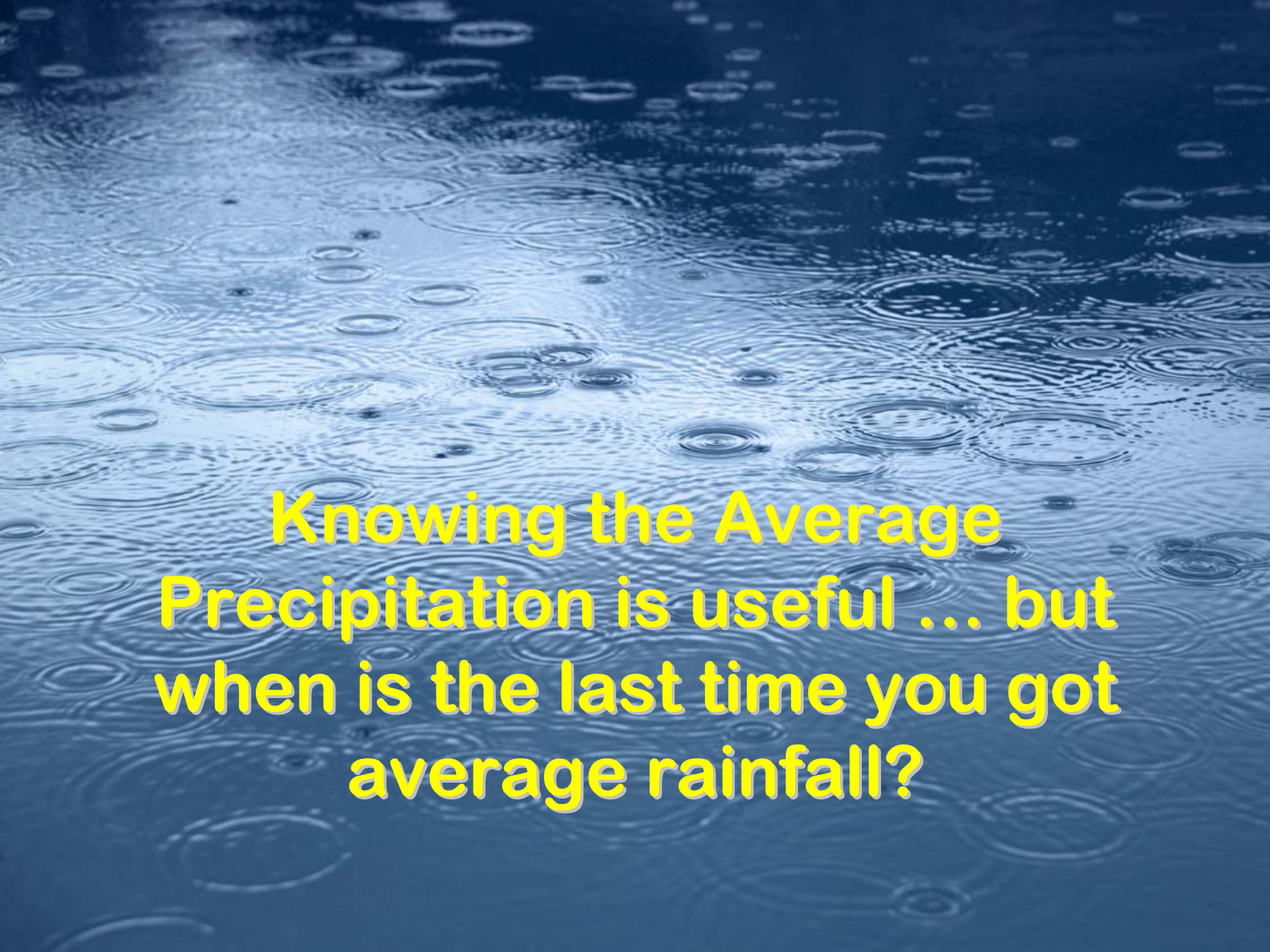


Average May-June Precipitation (Inches) (Based on 1961-90 observed data)



Average Precipitation (Inches)
For the Period 15 July – 25 August
(Based on 1961-1990 observed data)

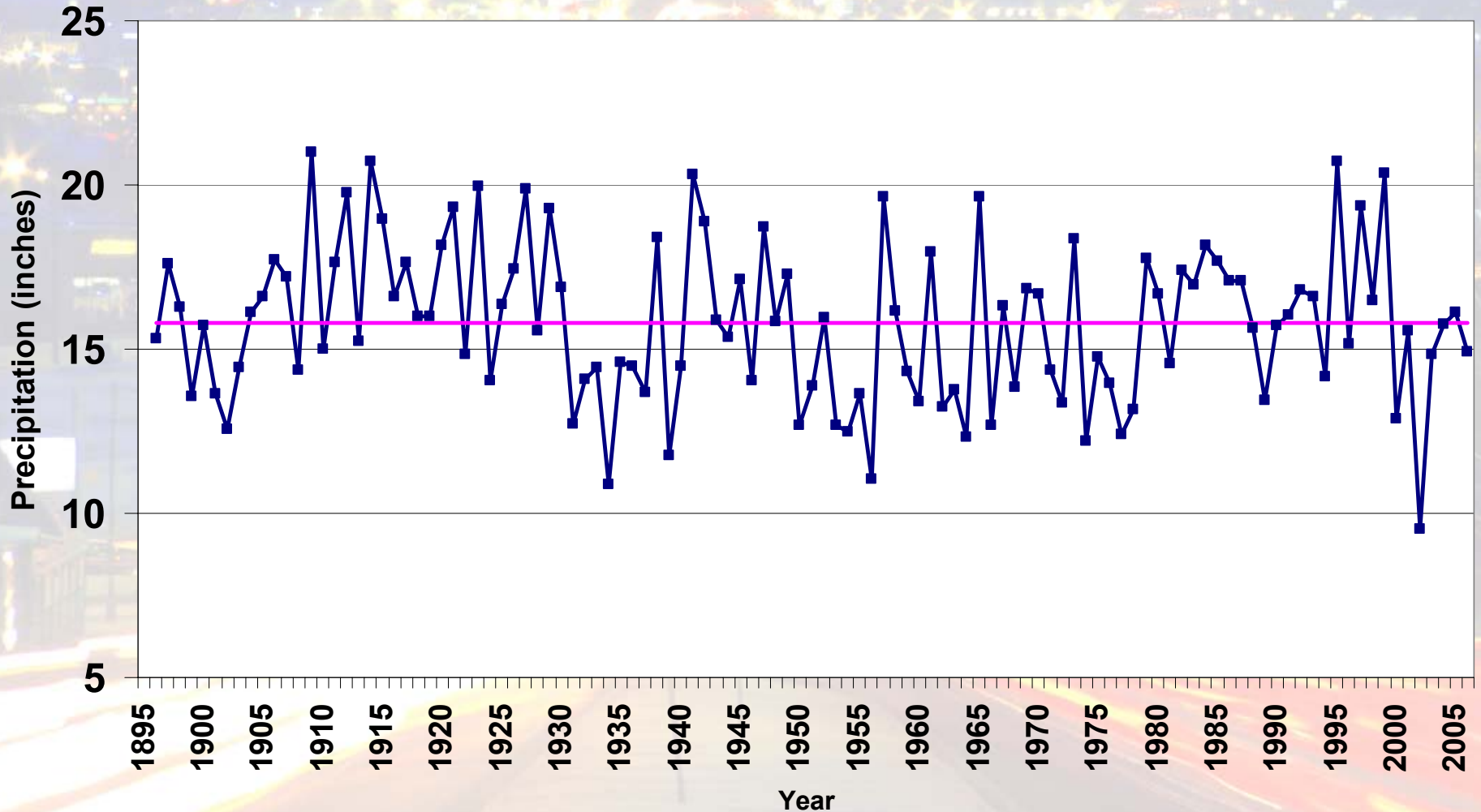


The background of the slide is a close-up photograph of a dark blue water surface. Numerous raindrops of varying sizes have fallen, creating a dense pattern of concentric ripples that catch the light, giving the surface a textured, shimmering appearance.

**Knowing the Average
Precipitation is useful ... but
when is the last time you got
average rainfall?**

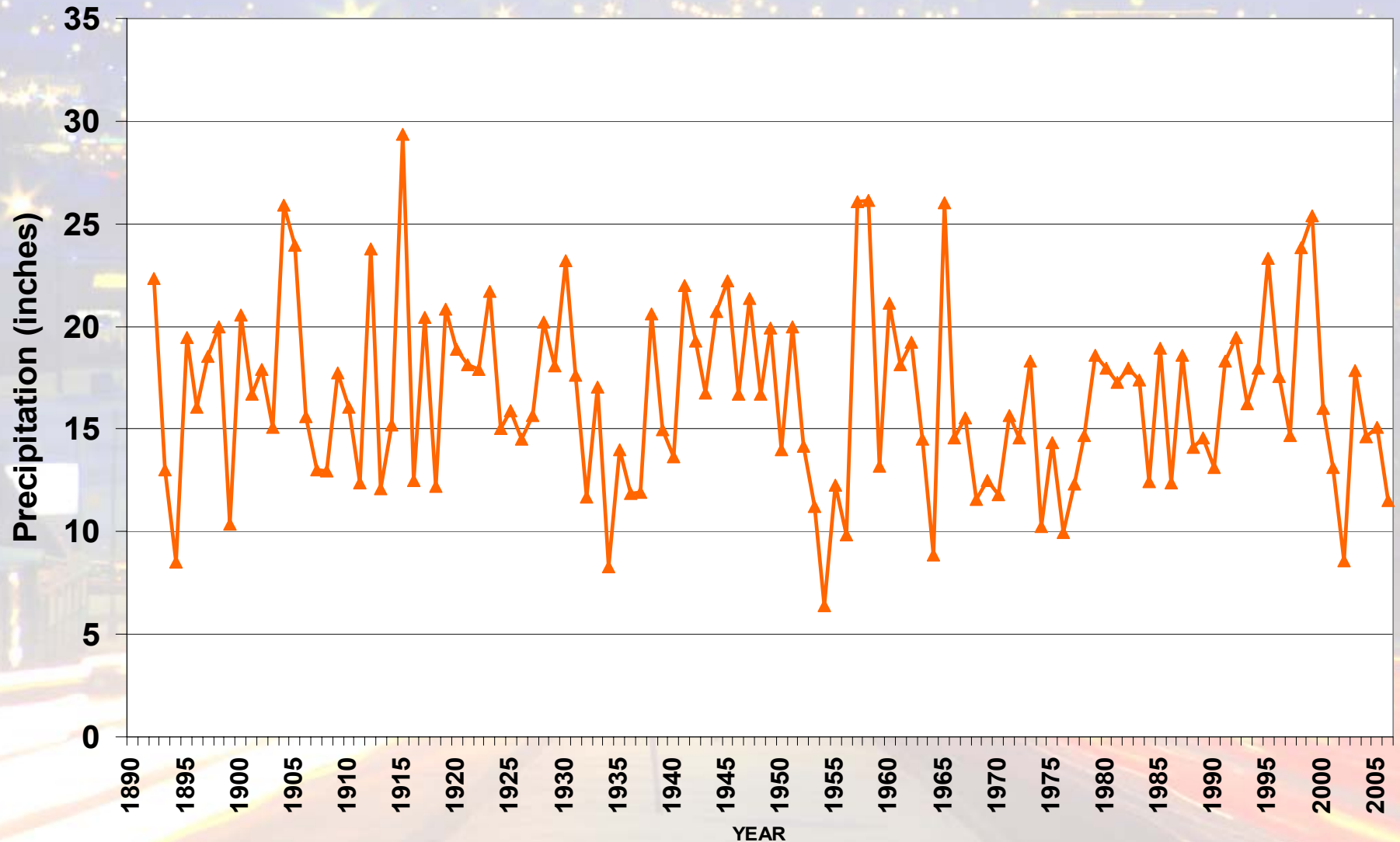
Have We Been Average? **NO!**

Colorado Statewide Water Year (Oct-Sep) Precipitation
from 1896 - 2006



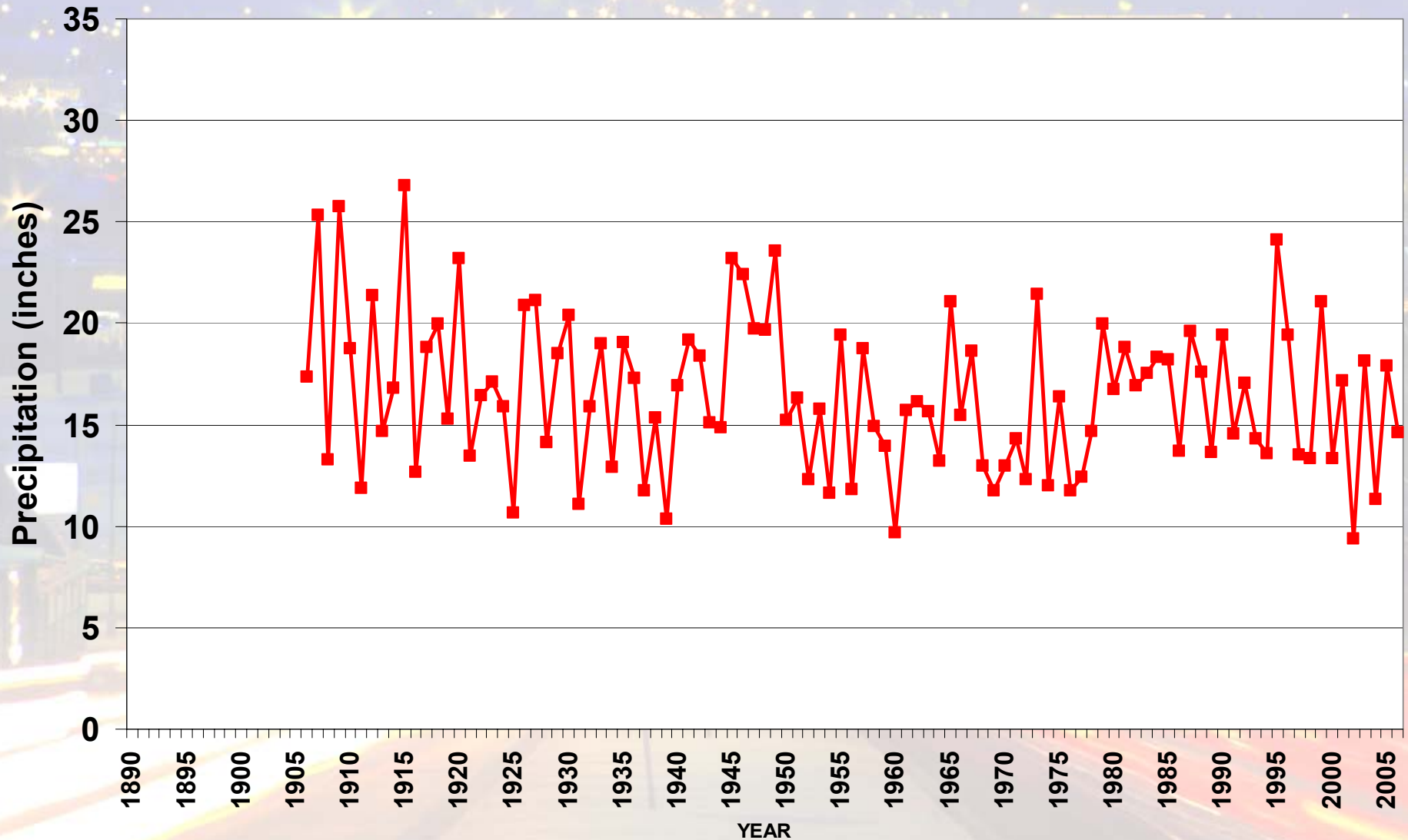
Burlington Water Year Precipitation

Water Year (Oct-Sep) Precipitation Comparison
for Burlington (through 2006)



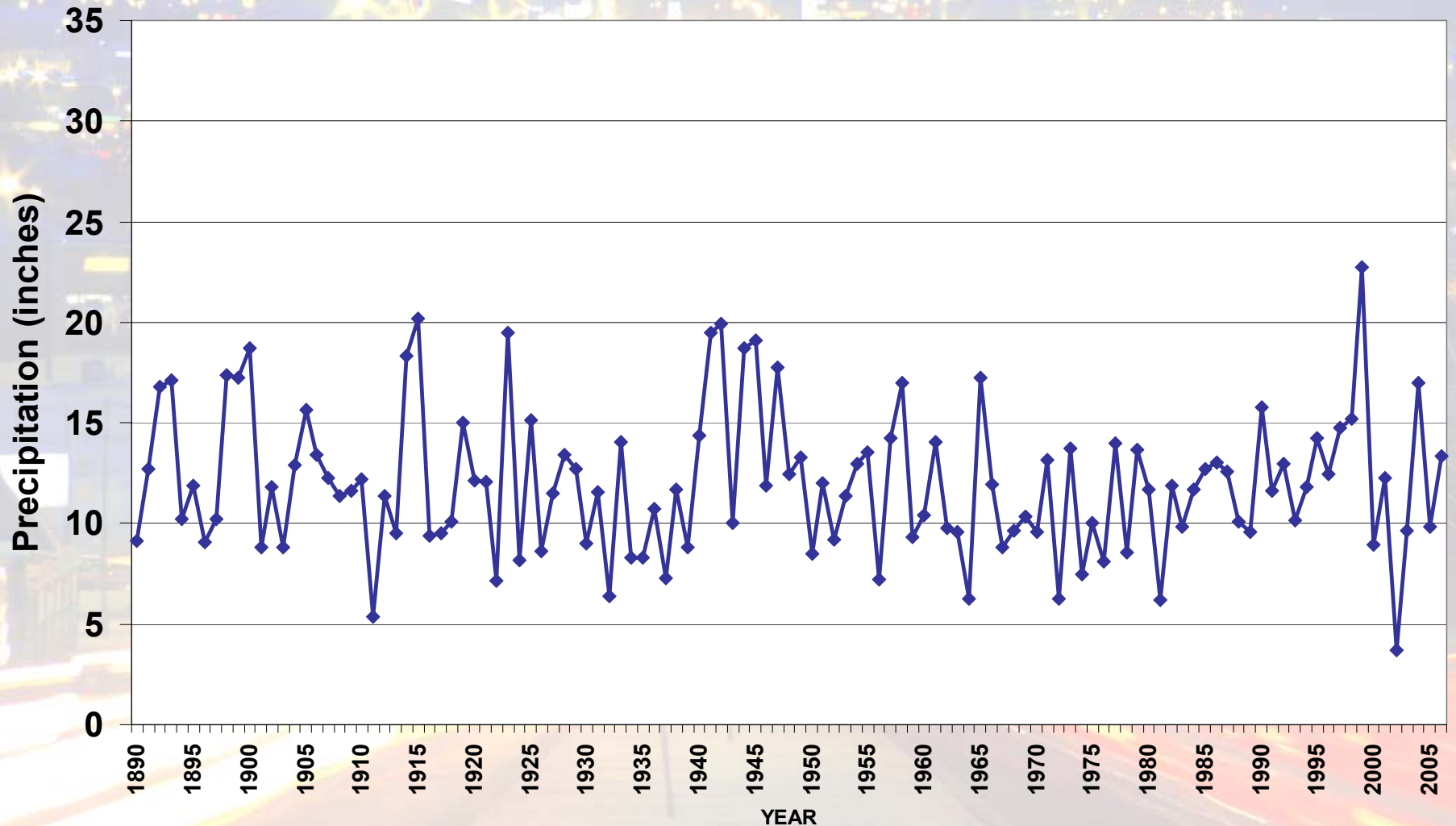
Akron Water Year Precipitation

Water Year (Oct-Sep) Precipitation Comparison
for Akron through 2006



Rocky Ford Water Year Precipitation

Water Year (Oct-Sep) Precipitation Comparison
for Rocky Ford through 2006

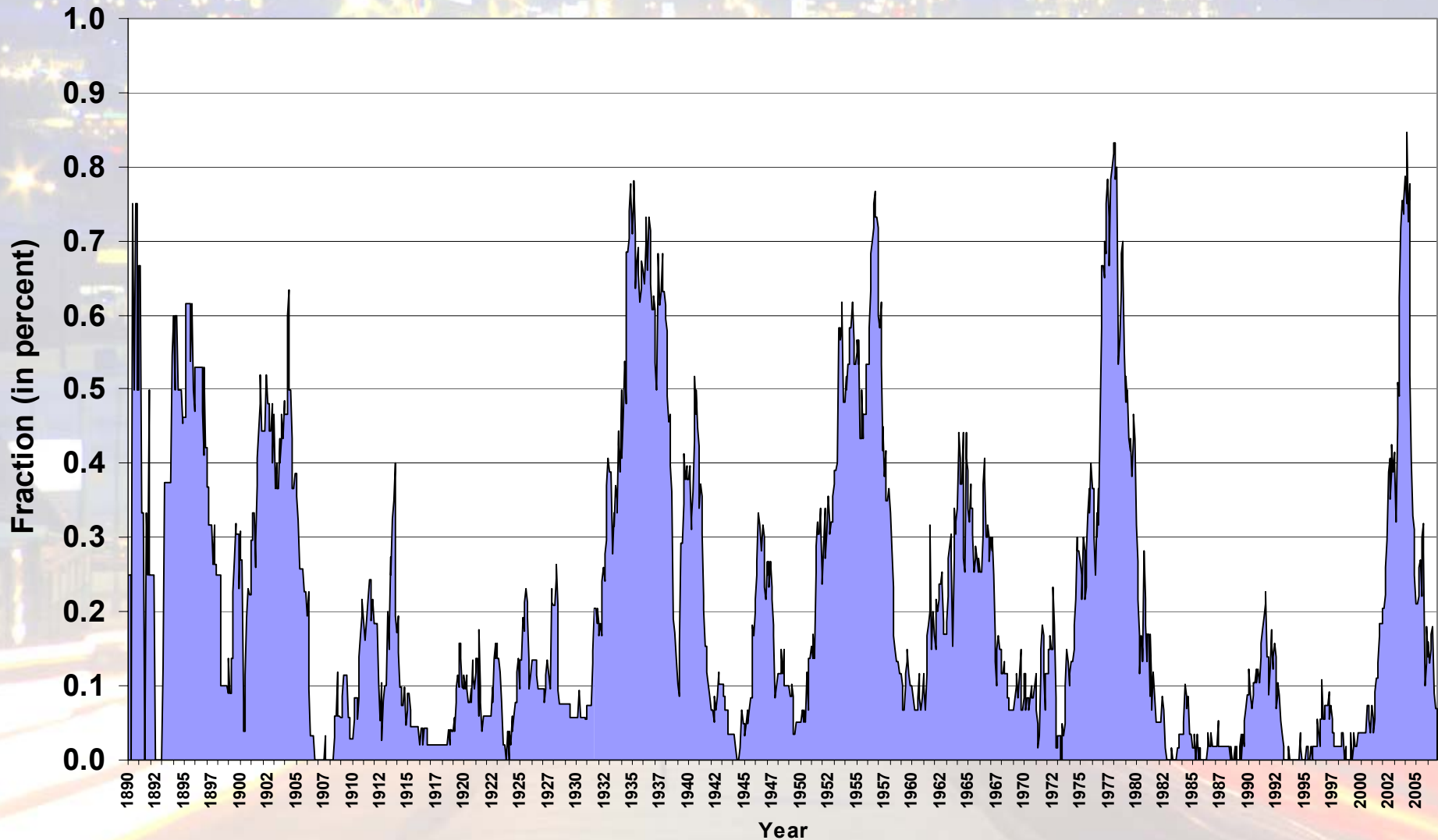


48-Month SPI

Fraction of Colorado in Drought

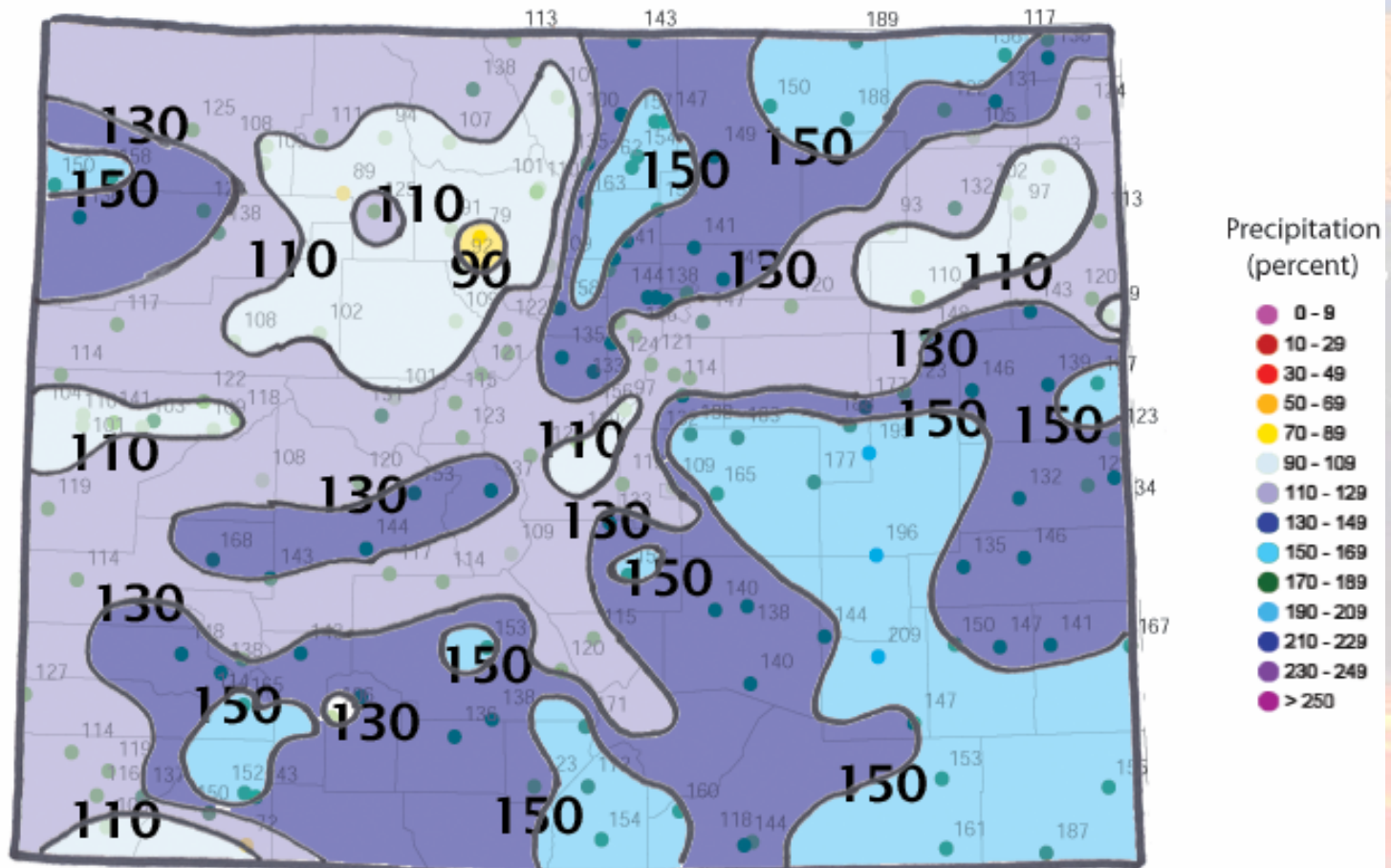
Based on 48 month SPI

(1890 - Nov 2006)



1999 Water Year Precipitation

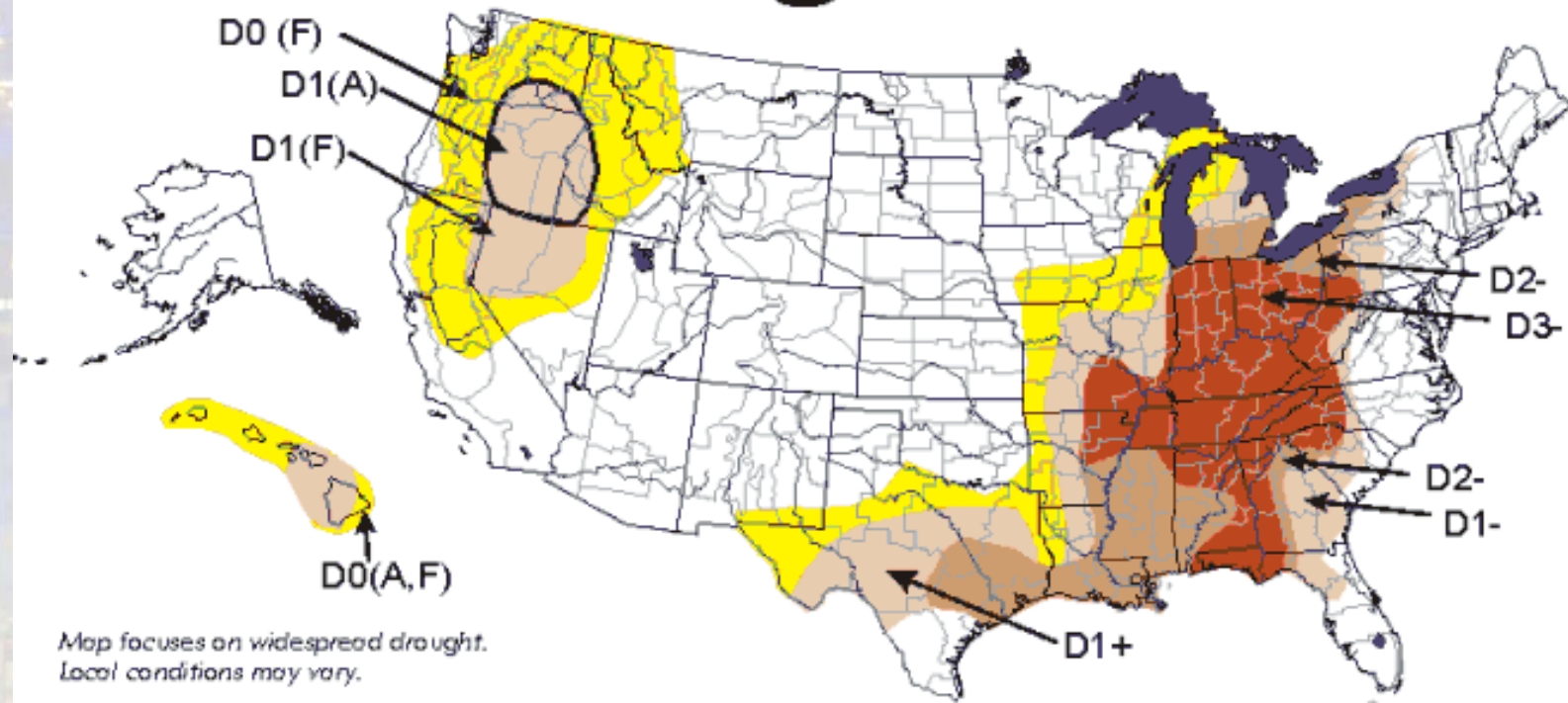
Water Year 1999
(Oct. 1998-Sept. 1999)
Precipitation Percent of Average for 1961-1990 Averages



Sept 1999 Drought Monitor Map

September 28, 1999

U.S. Drought Monitor



D0 Watch

D1 Drought

D2 Drought-Severe

D3 Drought-Extreme

D4 Drought-Exceptional

— Delineates Overlapping Areas

Drought type: used only
when impacts differ

A = Agriculture

W = Water

F = Forest fire danger



Plus (+) = Forecast to intensify next two weeks

Minus (-) = Forecast to diminish next two weeks

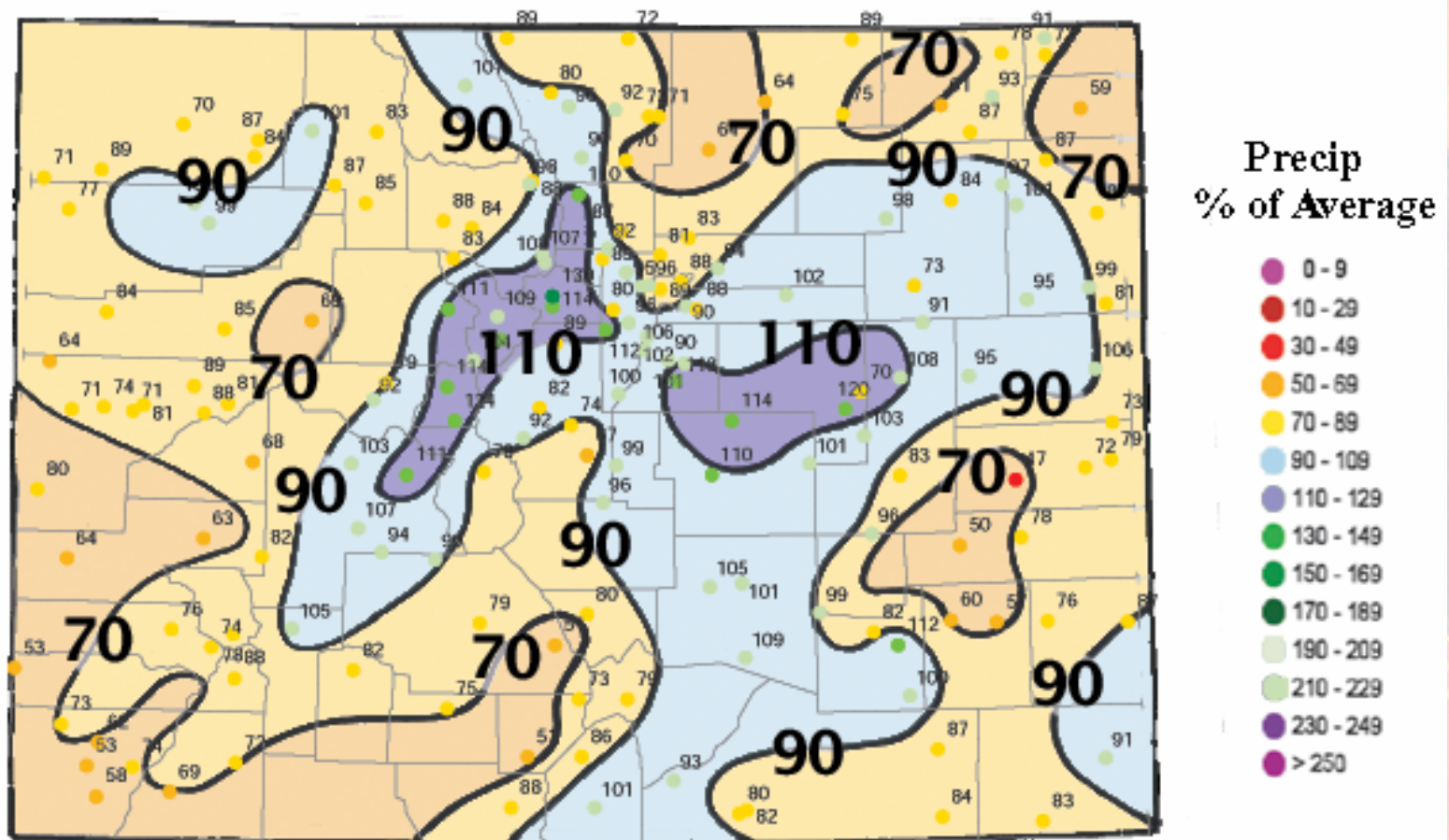
No sign = No change in drought classification forecast

• Released Thursday, Sep 30, 1999 •

2000 Water Year Precipitation

Water Year 2000
(Oct. 1999 - Sept. 2000)

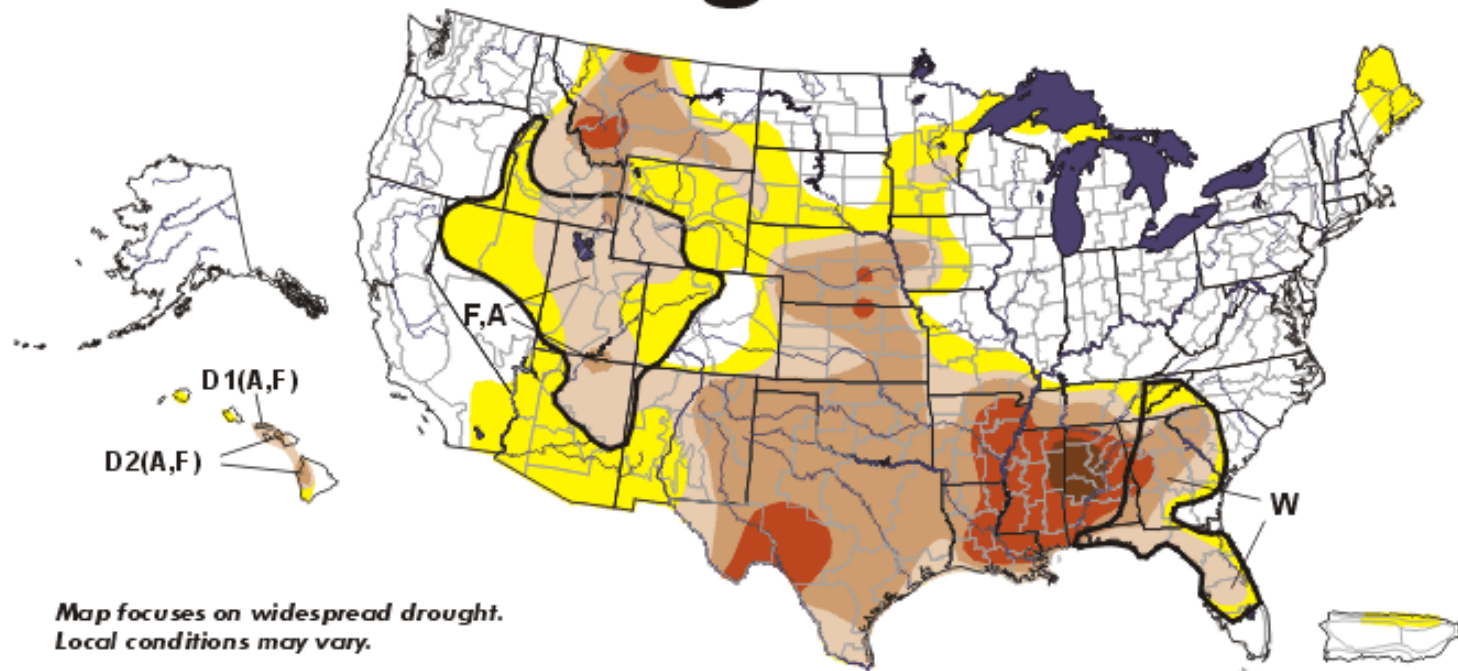
Precipitation Percent of Average for 1961-1990 Averages



October 2000 Drought Monitor Map

October 3, 2000 Valid 8 a.m. EDT

U.S. Drought Monitor



**Map focuses on widespread drought.
Local conditions may vary.**

- | | |
|------------------------------|--|
| D0 Abnormally Dry | Drought type: used only
when impacts differ |
| D1 Drought—First Stage | |
| D2 Drought—Severe | |
| D3 Drought—Extreme | |
| D4 Drought—Exceptional | |
| Delineates Overlapping Areas | A = Agriculture |
| | W = Water |
| | F = Wildfire danger |

See accompanying text summary for forecast statements
<http://ens o.unl.e du/monitor/monitor.html>



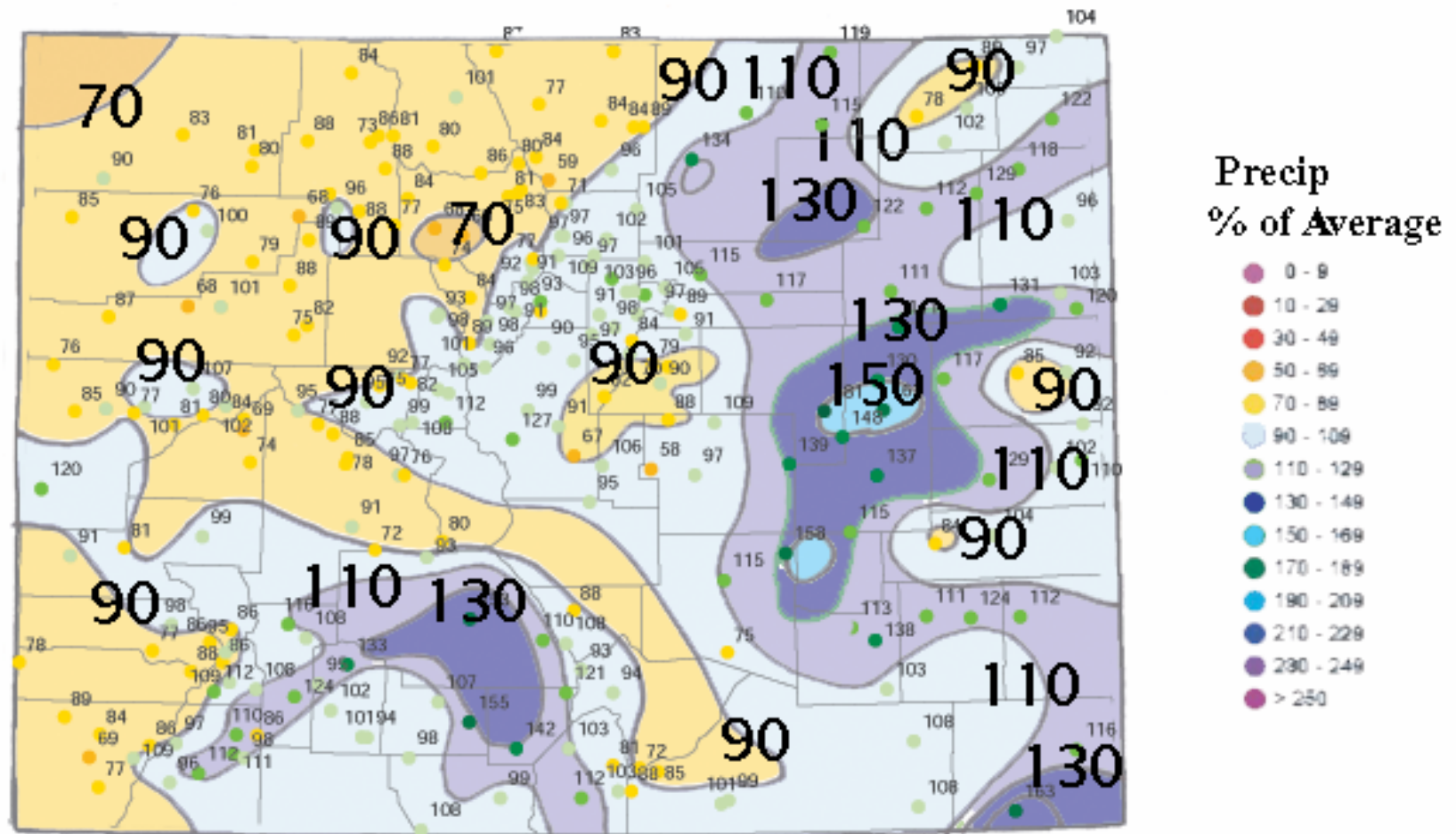
● Released Thursday, Oct. 5, 2000 ●

2001 Water Year Precipitation

Water Year 2001

(Oct. 2000 - Sept. 2001)

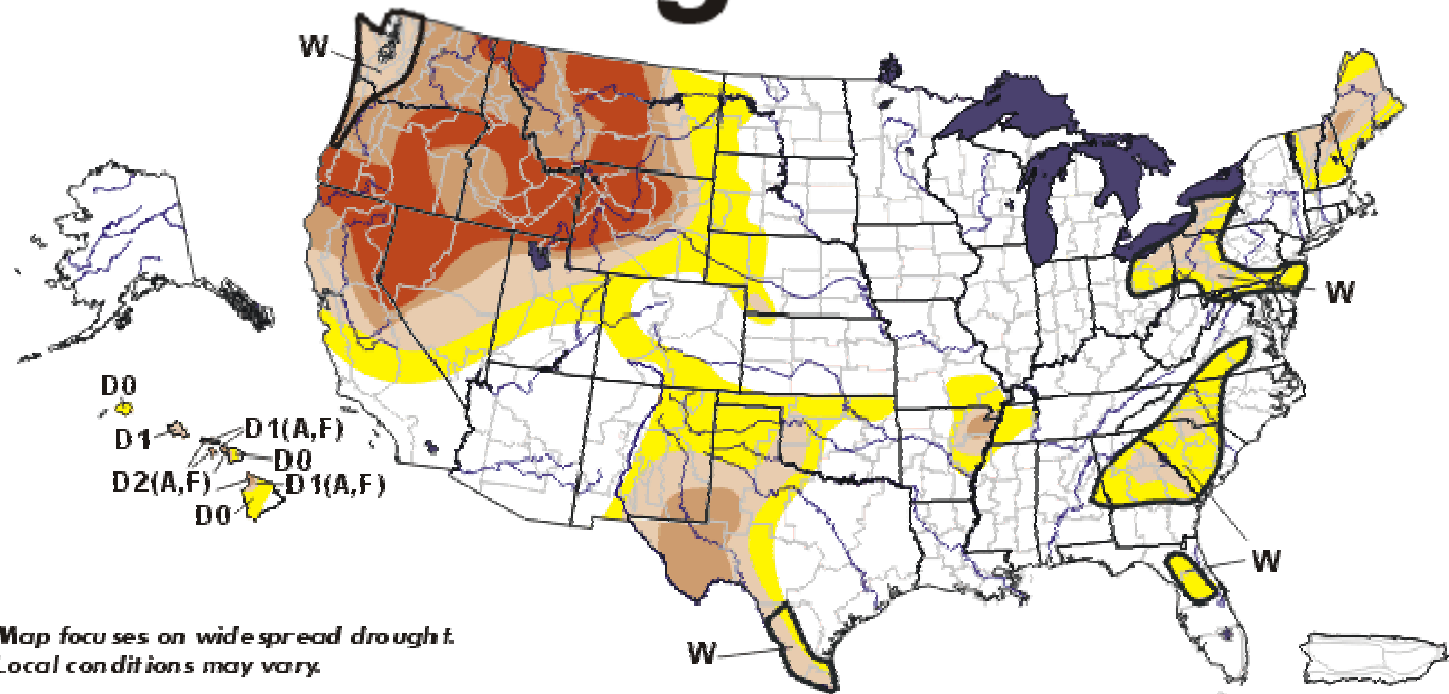
Precipitation Percent of Average for 1961-1990 Averages



October 2001 Drought Monitor Map

October 2, 2001 Valid 8 a.m. EDT

U.S. Drought Monitor



- D0 Abnormally Dry
- D1 Drought—Moderate
- D2 Drought—Severe
- D3 Drought—Extreme
- D4 Drought—Exceptional
- Delineates Overlapping Areas

Drought Impact Types:
A = Agriculture
W = Water (Hydrological)
F = Fire danger (Wildfires)
(No type = All 3 impacts)



See accompanying text summary for forecast statements
<http://fens.o.unl.edu/monitor/monitor.html>

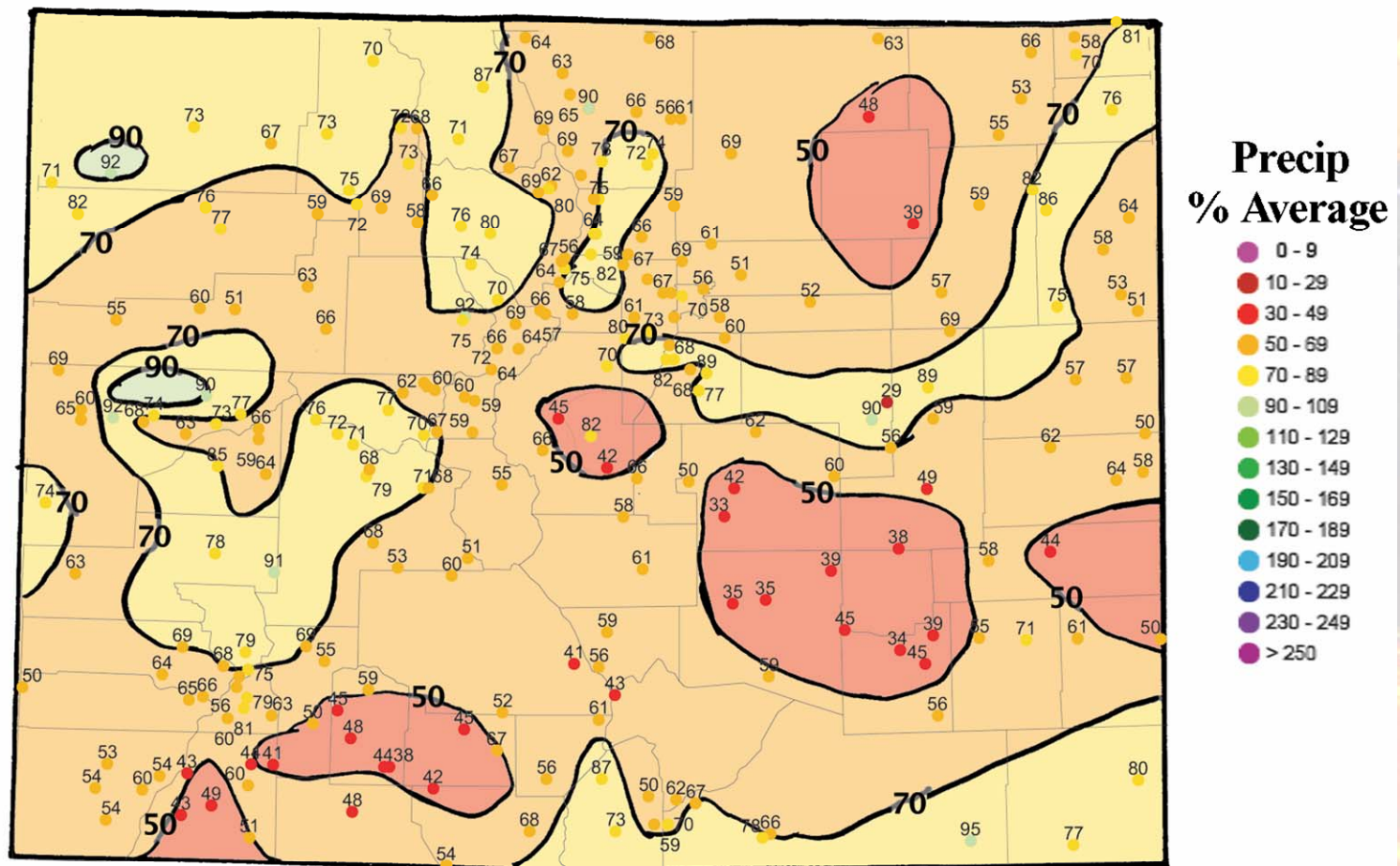
● Released Thursday, October 4, 2001 ●

Author: Douglas Le Comte, NOAA/CPC

2002 Water Year Precipitation

Water Year 2002
(Oct. 2001 - Sept. 2002)

Precipitation Percent of Average for 1961-1990 Averages

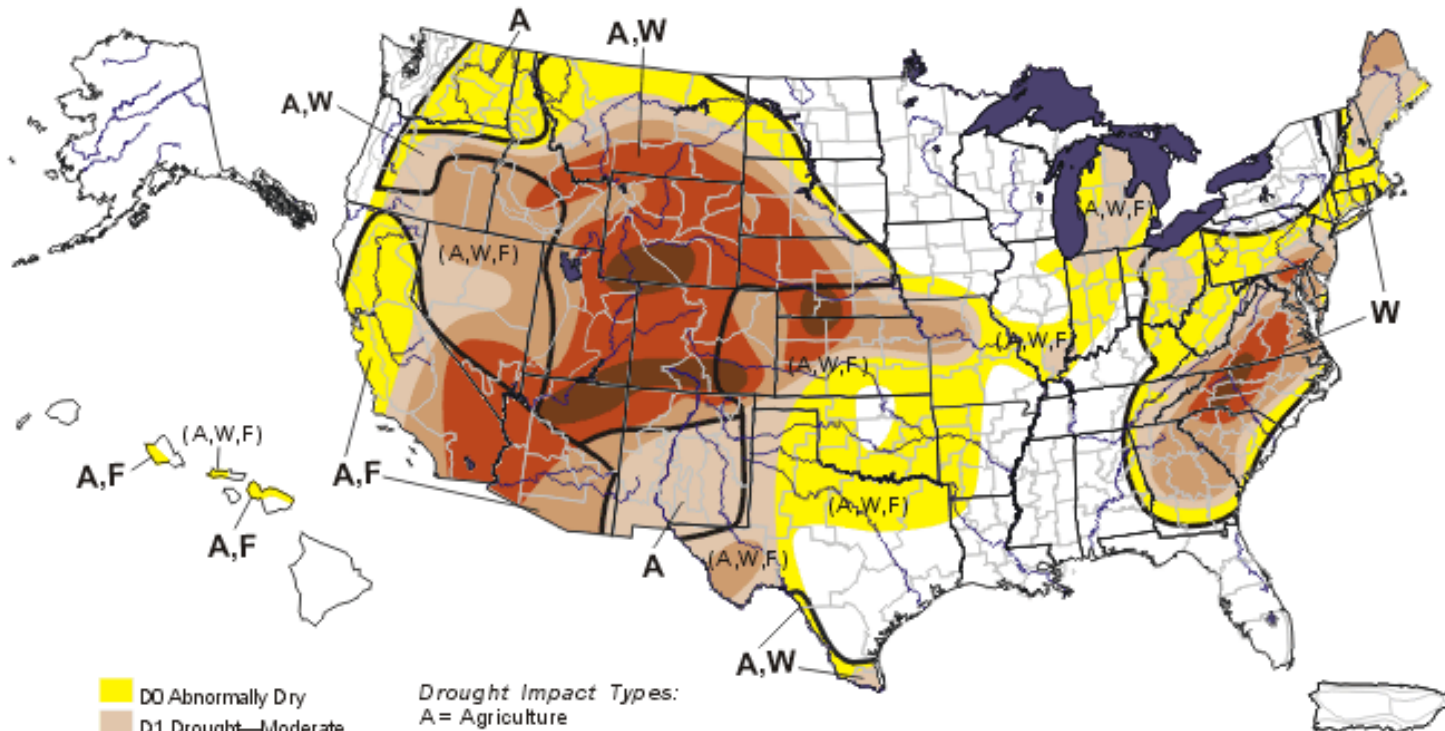


October 2002 Drought Monitor Map

U.S. Drought Monitor

October 1, 2002

Valid 8 a.m. EDT



- D0 Abnormally Dry
- D1 Drought—Moderate
- D2 Drought—Severe
- D3 Drought—Extreme
- D4 Drought—Exceptional

Drought Impact Types:

- A = Agriculture
- W = Water (Hydrological)
- F = Fire danger (Wildfires)
- Delineates dominant impacts
(No type = All 3 impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, October 3, 2002

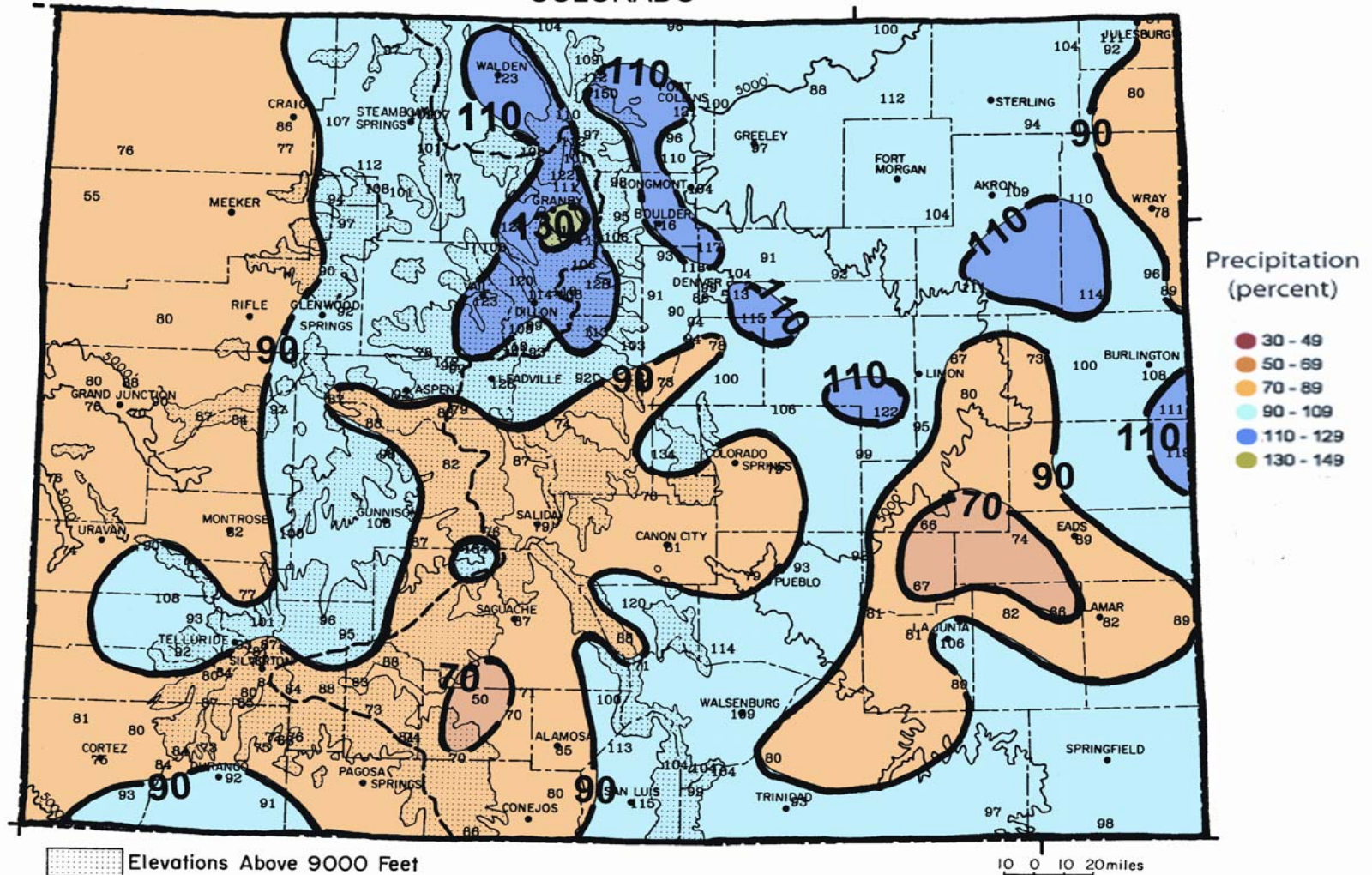
Author: Rich Tinker, CPC/NCEP/NWS/NOAA

2003 Water Year Precipitation

Water Year 2003

October 2002 - September 2003 precipitation
as a percent of the 1971-2000 average.

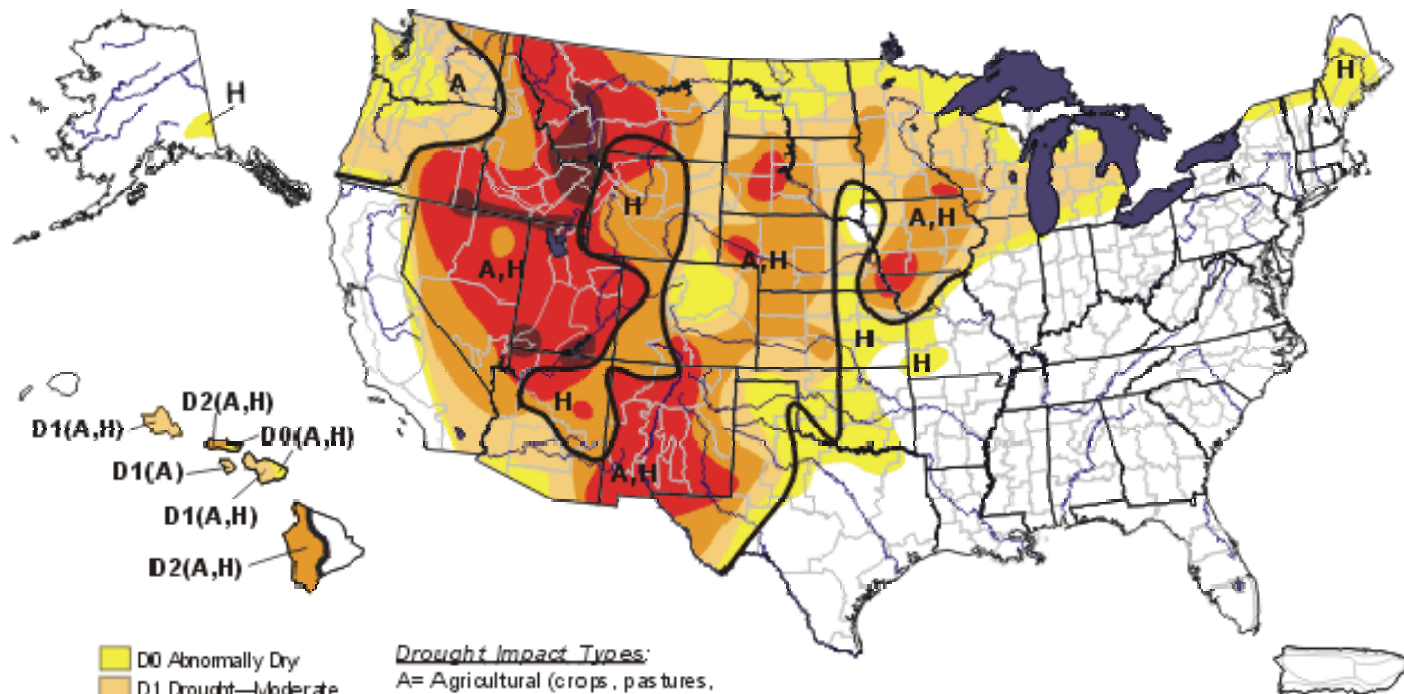
COLORADO



September 2003 Drought Monitor Map

U.S. Drought Monitor

September 30, 2003
Valid 8 a.m. EDT



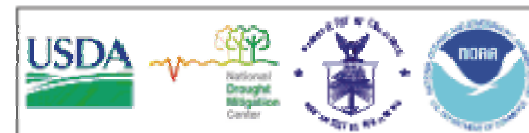
- D0 Abnormally Dry
- D1 Drought—Moderate
- D2 Drought—Severe
- D3 Drought—Extreme
- D4 Drought—Exceptional

Drought Impact Types:

- A= Agricultural (crops, pastures, grasslands)
- H= Hydrological (water)
- No type = both impacts
- Delineates dominant impacts

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

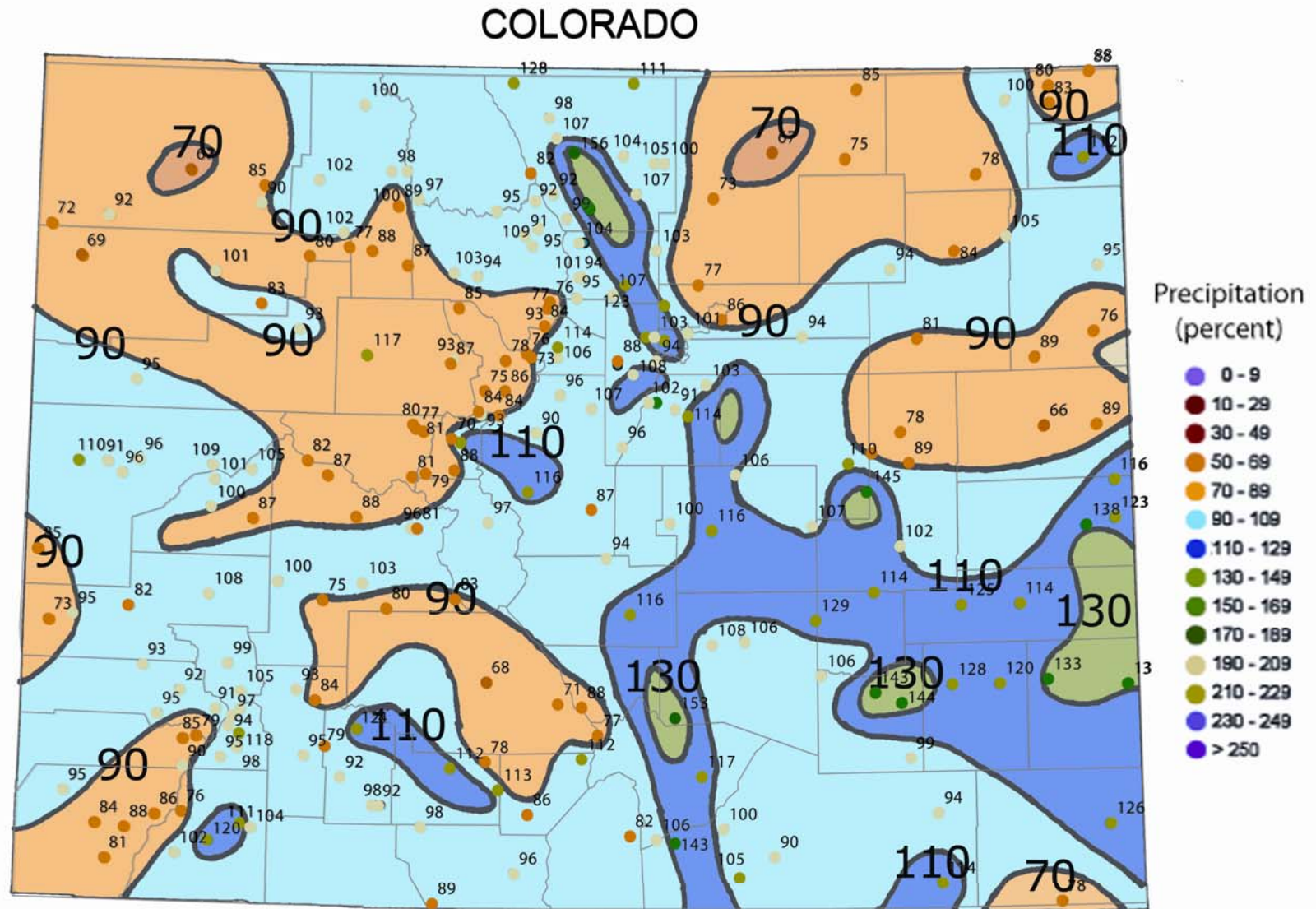
<http://drought.unl.edu/dm>



Released Thursday, October 2, 2003

Author: Candace Tankersley/Scott Stephens, NOAA/NCDC

2004 Water Year Precipitation



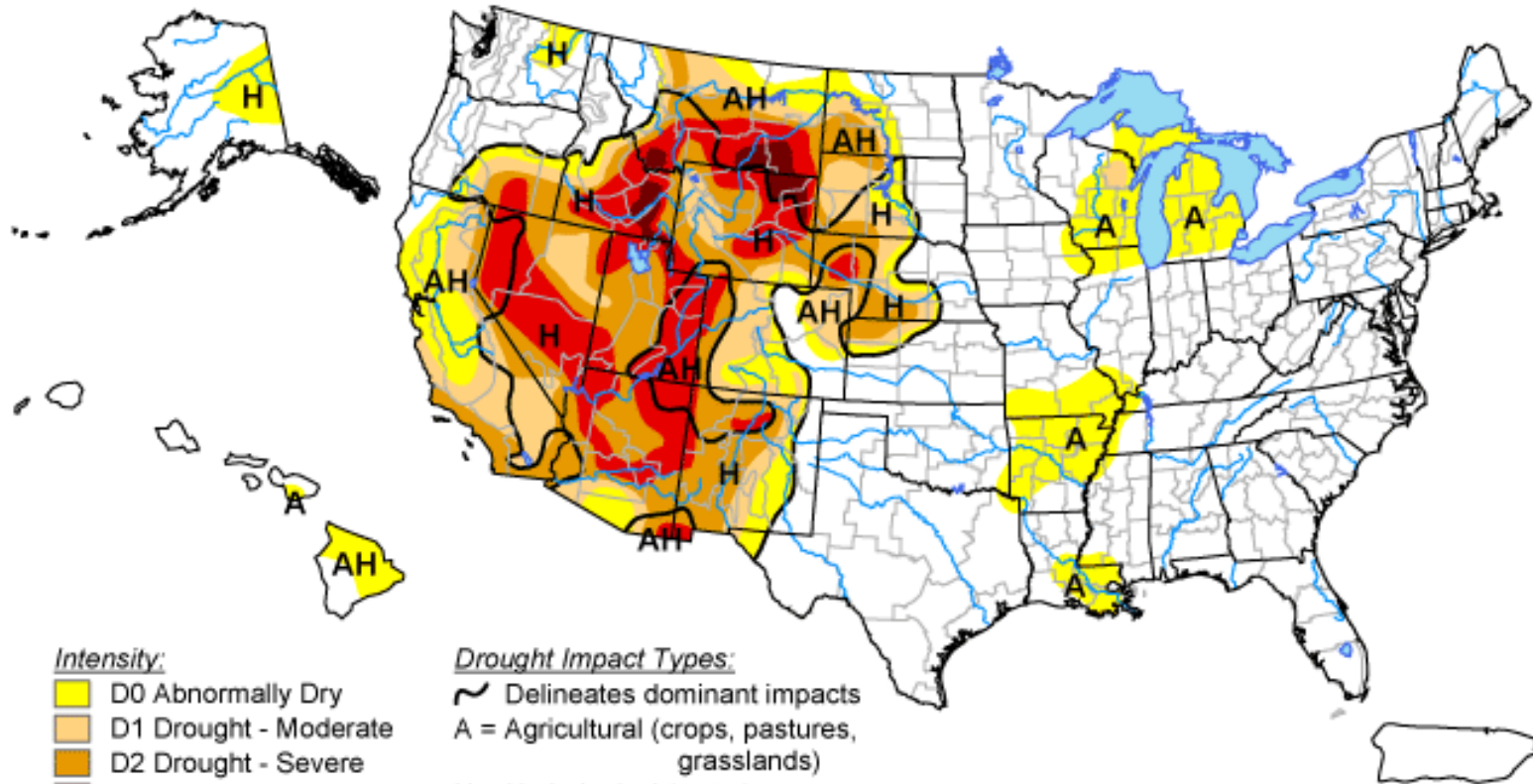
Water Year 2004 (October 2003 through September 2004) precipitation as a percent of the 1971-2000 average.

September 2004 Drought Monitor Map

U.S. Drought Monitor

September 28, 2004

Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)
- (No type = Both impacts)

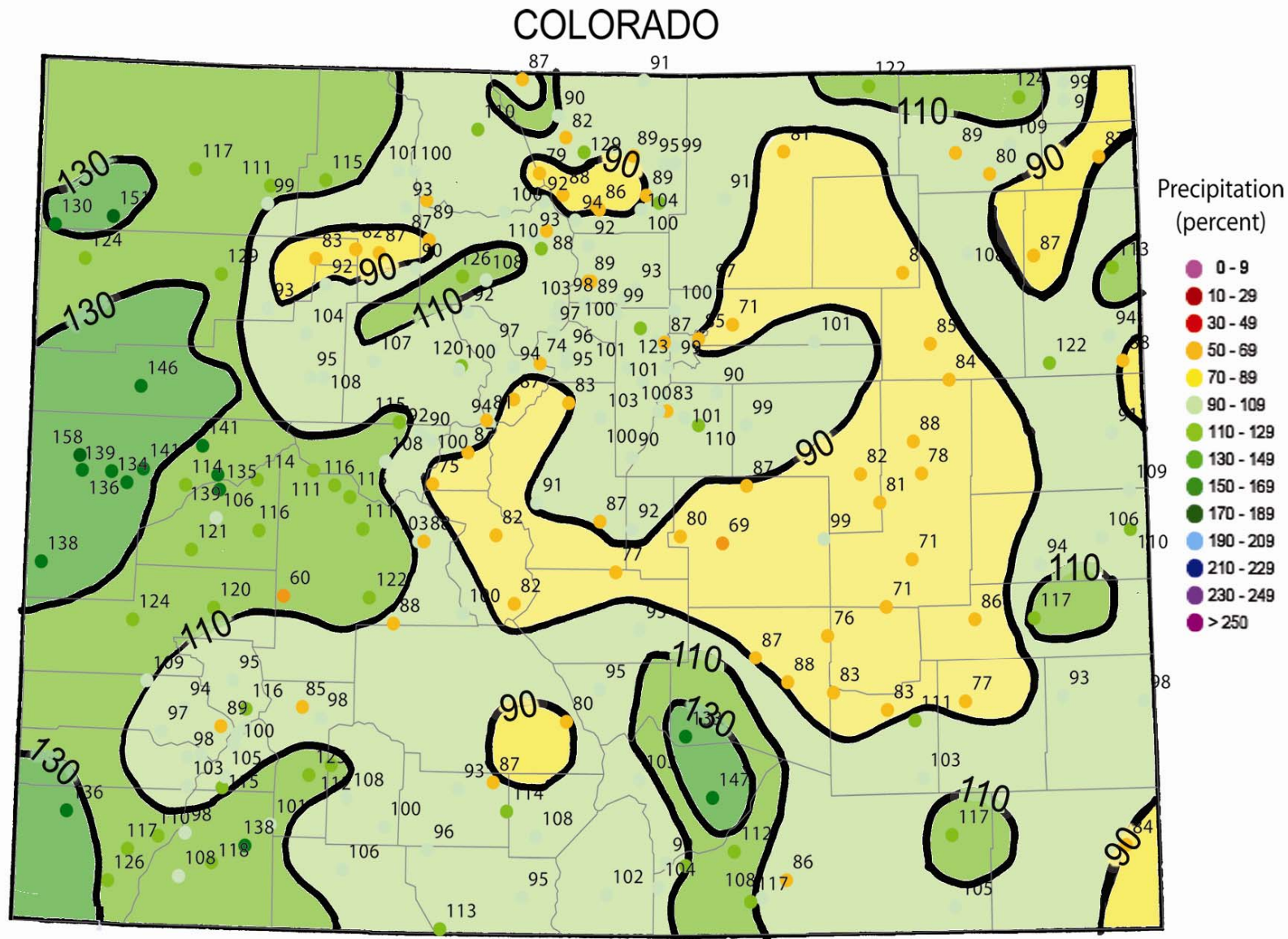
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, September 30, 2004
Author: Brad Rippey, U.S. Department of Agriculture

2005 Water Year Precipitation

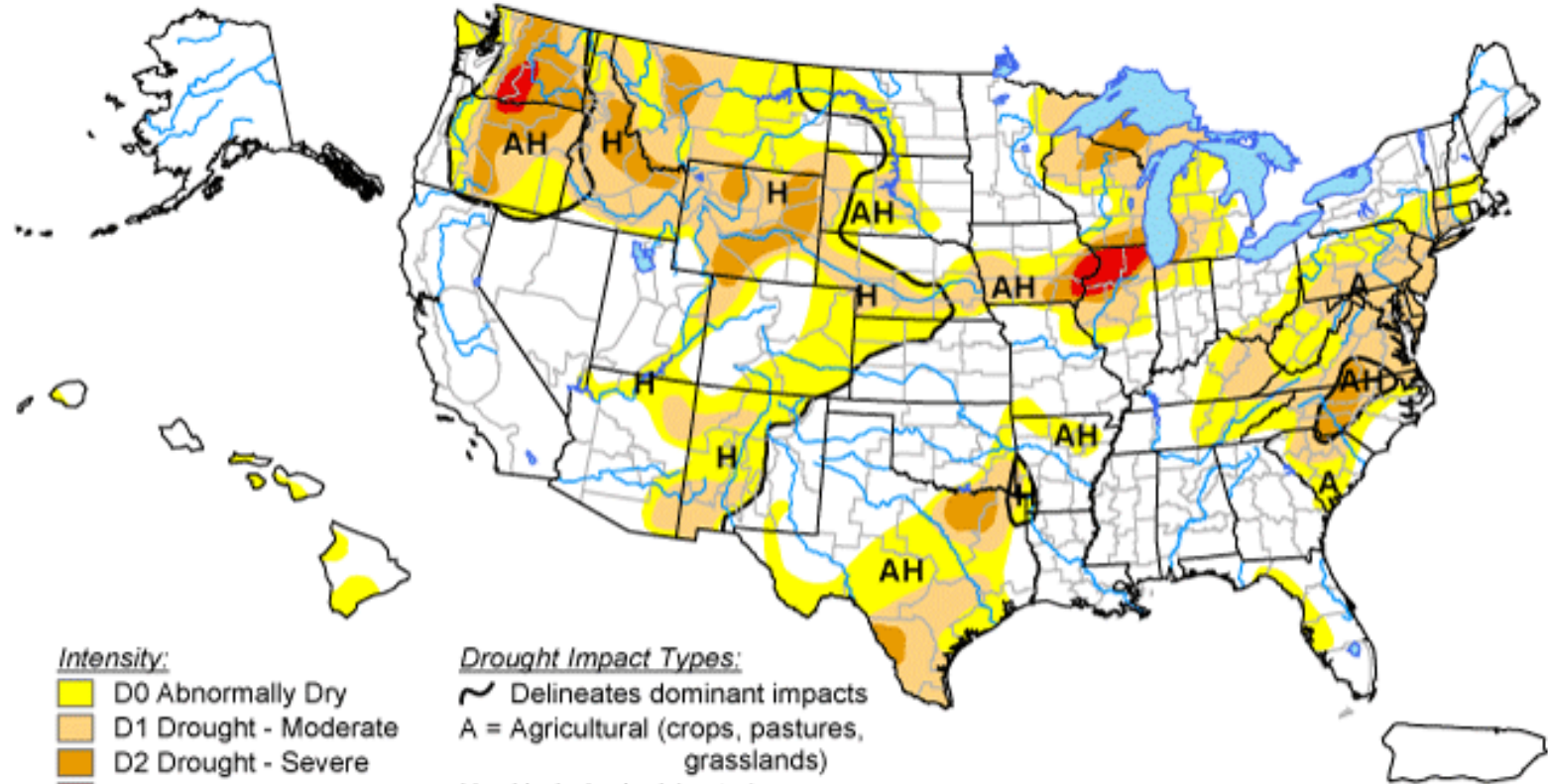


Water Year 2005 (Oct 04 - Sep 05) precipitation as a percent of the 1971-2000 average.

October 2005 Drought Monitor Map

U.S. Drought Monitor

October 4, 2005
Valid 8 a.m. EDT



Intensity:

- Yellow: D0 Abnormally Dry
- Light Orange: D1 Drought - Moderate
- Orange: D2 Drought - Severe
- Red: D3 Drought - Extreme
- Dark Red: D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)
- (No type = Both impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, October 6, 2005

Author: RichTinker, CPC/NCEP/NWS/NOAA

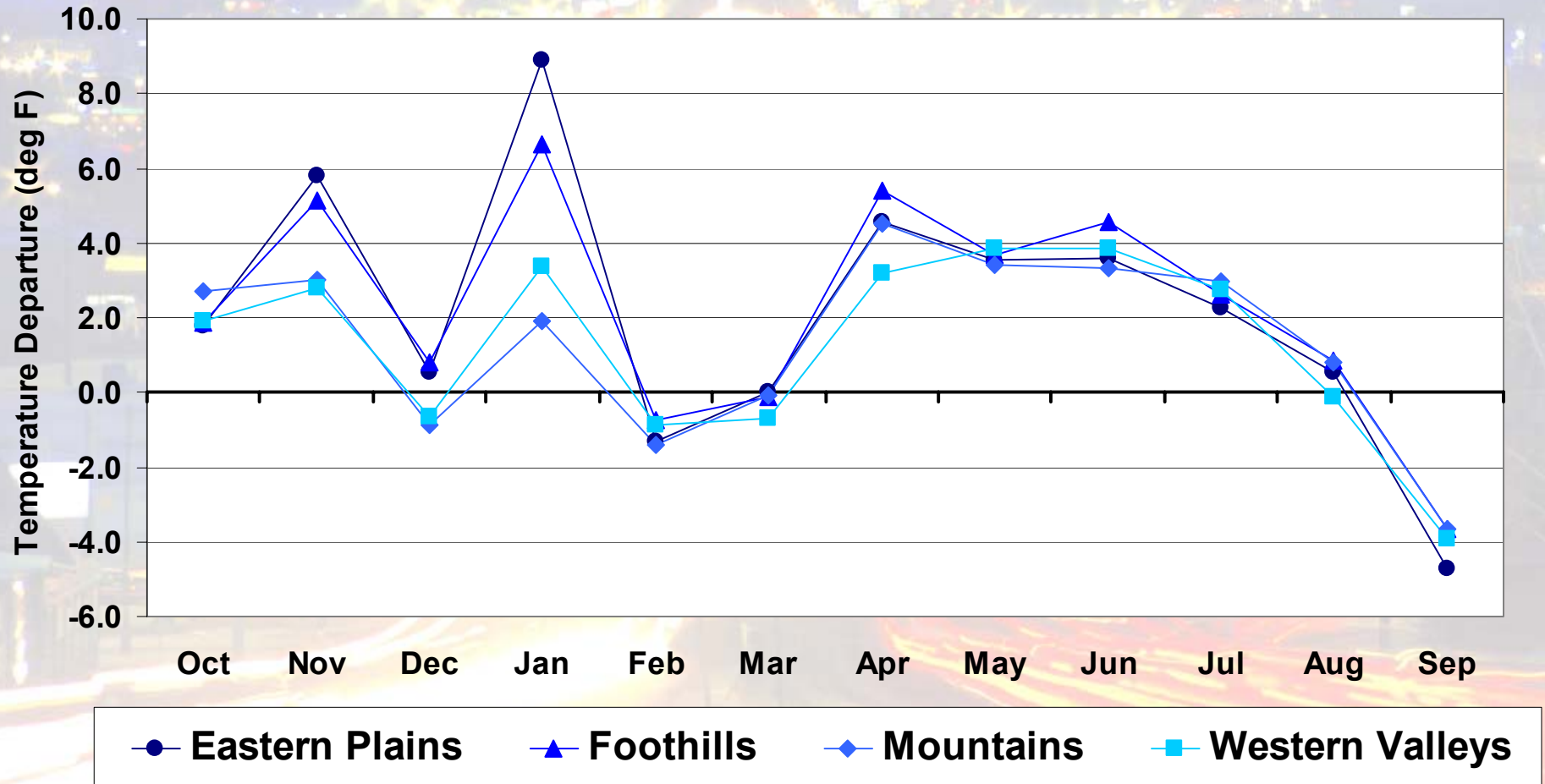
What happened this past year?

WY2006 Highlights

- Soaking October storm – especially over Eastern Colorado
- Windy, dry winter over Foothills and Eastern Plains
- Frequent midwinter snows Northern Mountains
- Very warm and dry spring (tough on Agriculture)
- Early July soaking
- Wet summer over much of southern Colorado
- A chilly ending to another warm year

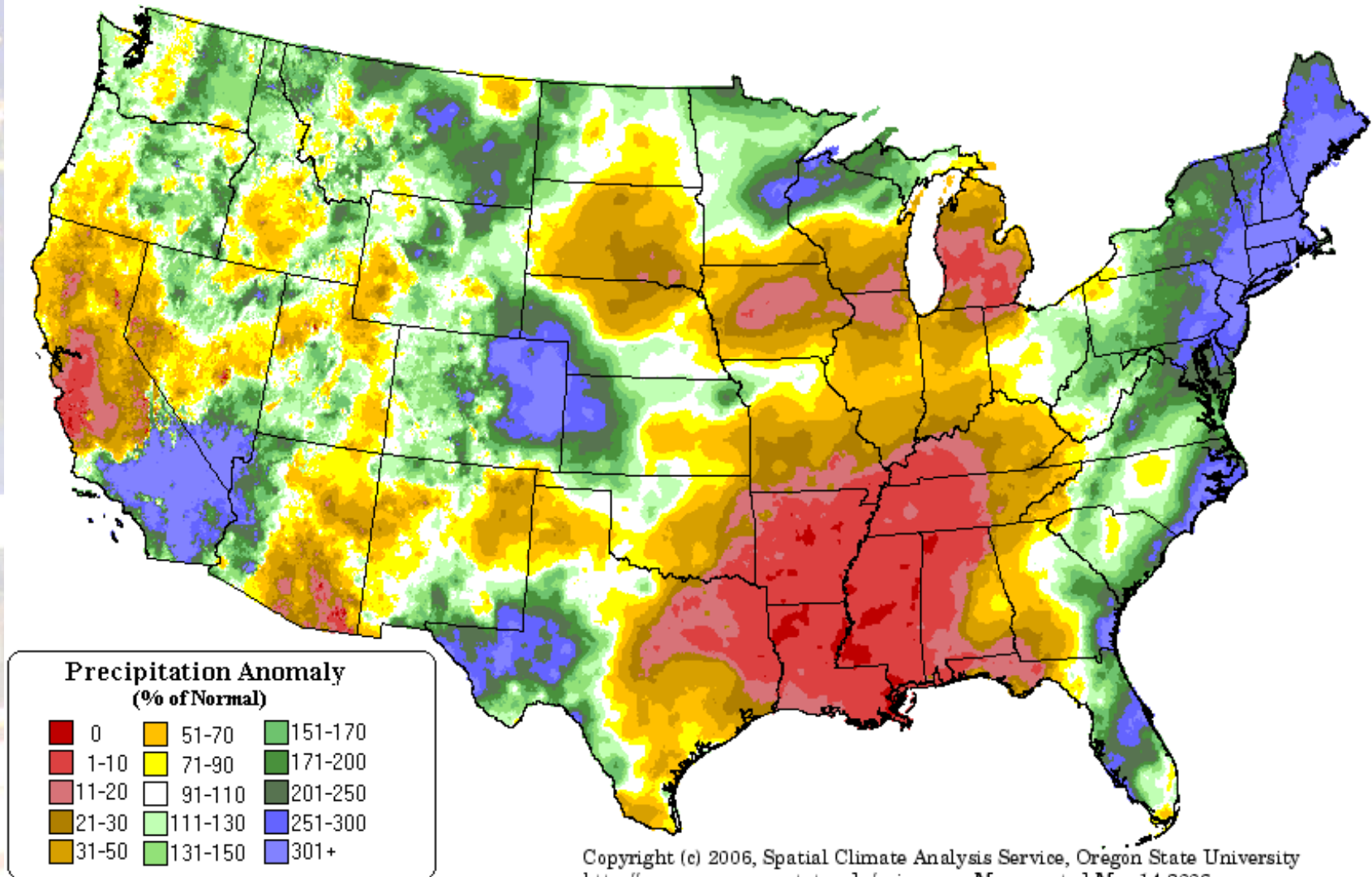
Water Year 2006 temperature departures from 1971-2000 average

Temperature Departures for Water Year 2006



October 2005 precipitation as percent of average (Prism)

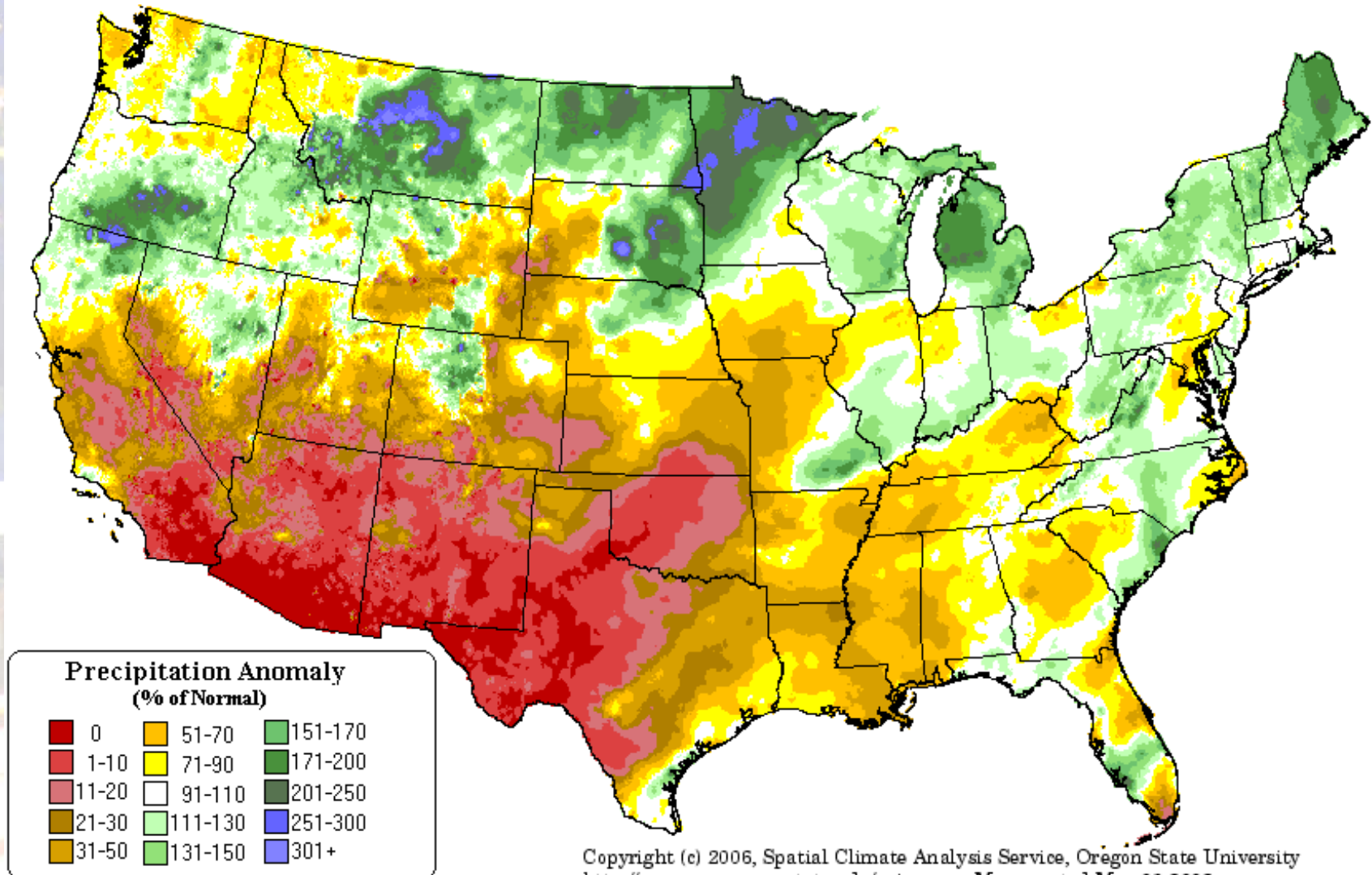
Precipitation Anomaly: Oct 2005 Final Data



Copyright (c) 2006, Spatial Climate Analysis Service, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Mar 14 2006

November 2005 precipitation as percent of average (Prism)

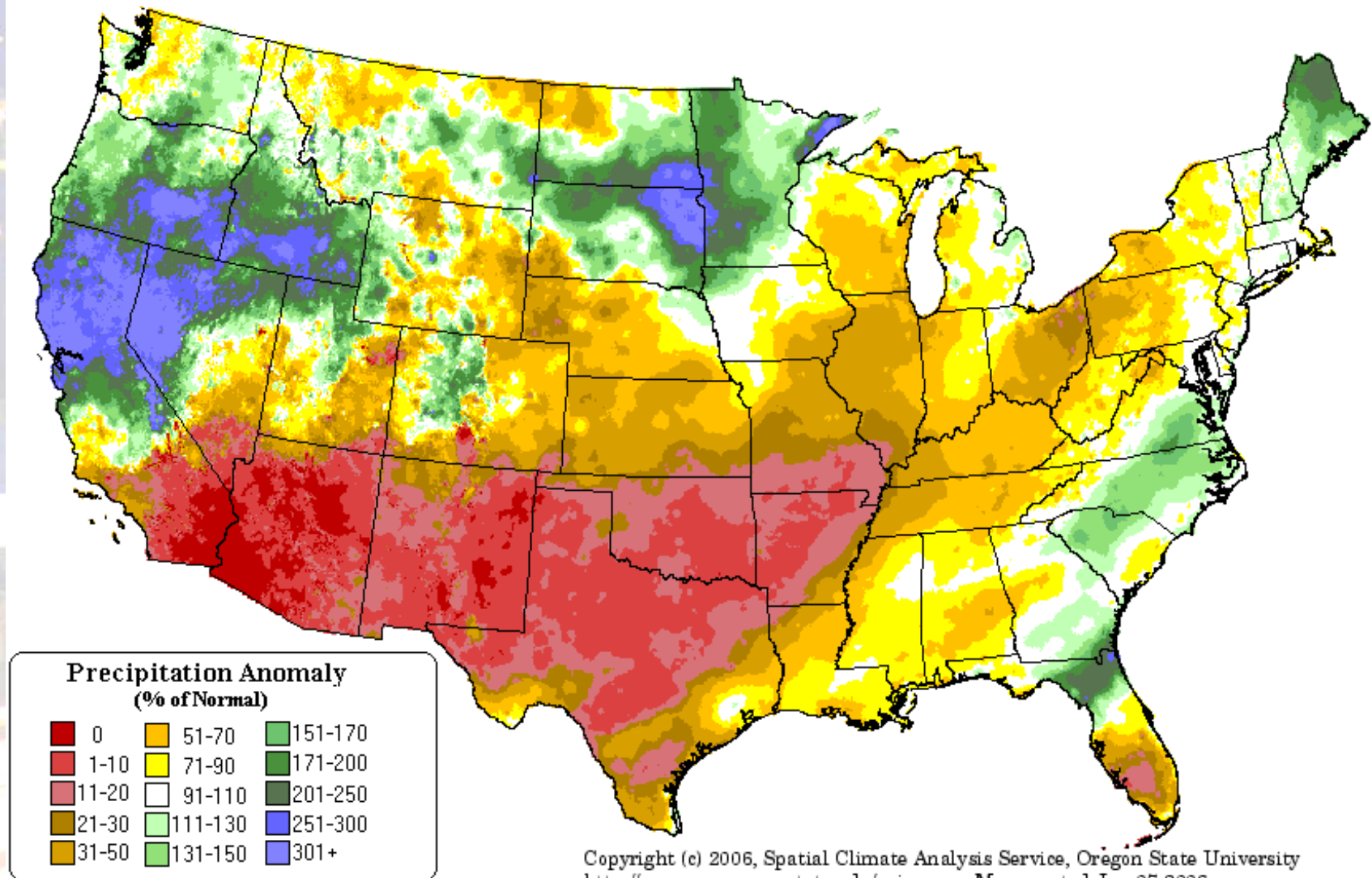
Precipitation Anomaly: Nov 2005
Final Data



Copyright (c) 2006, Spatial Climate Analysis Service, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created May 09 2006

December 2005 precipitation as a percent of average (Prism)

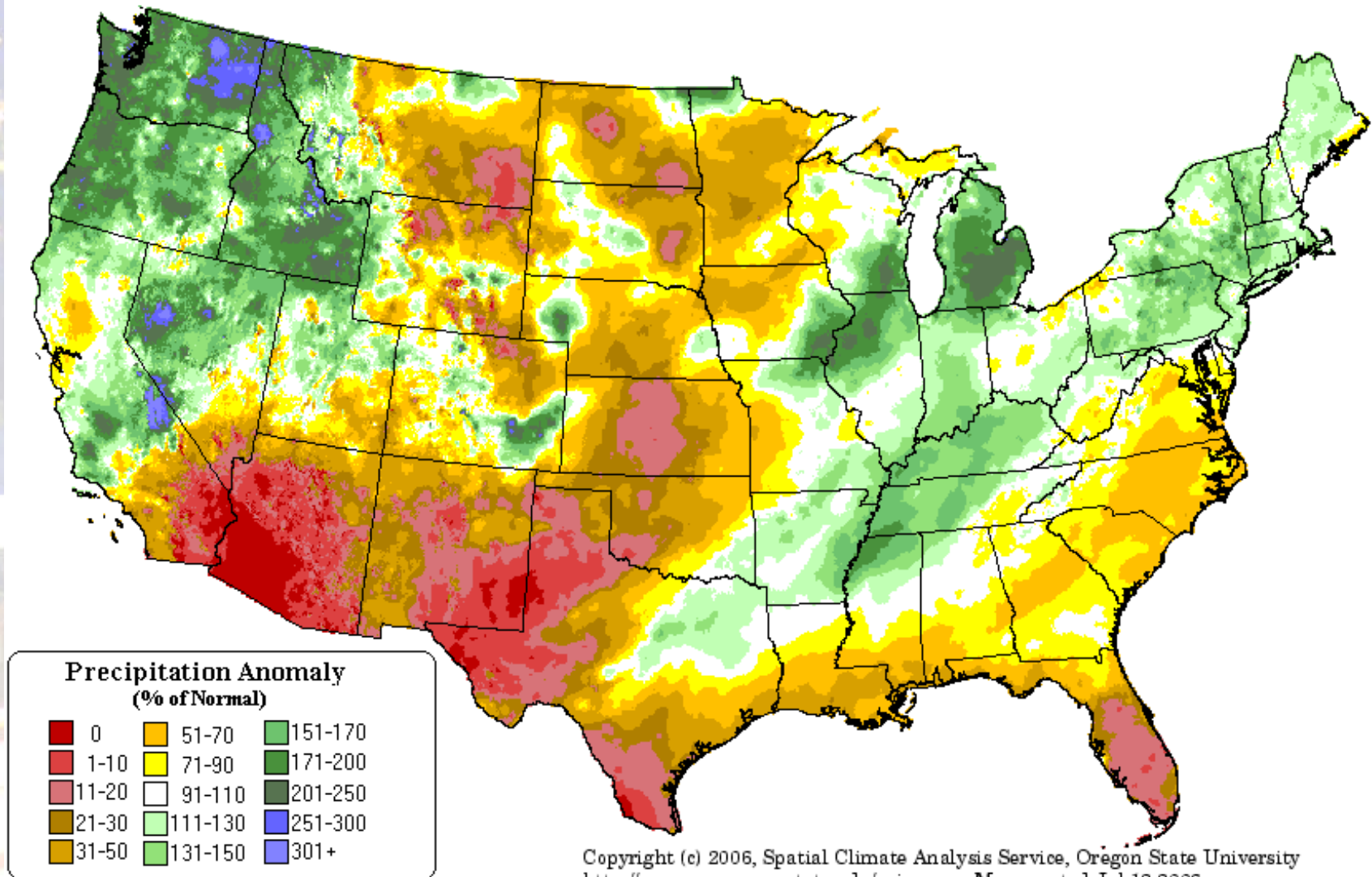
Precipitation Anomaly: Dec 2005 Final Data



Copyright (c) 2006, Spatial Climate Analysis Service, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Jun 07 2006

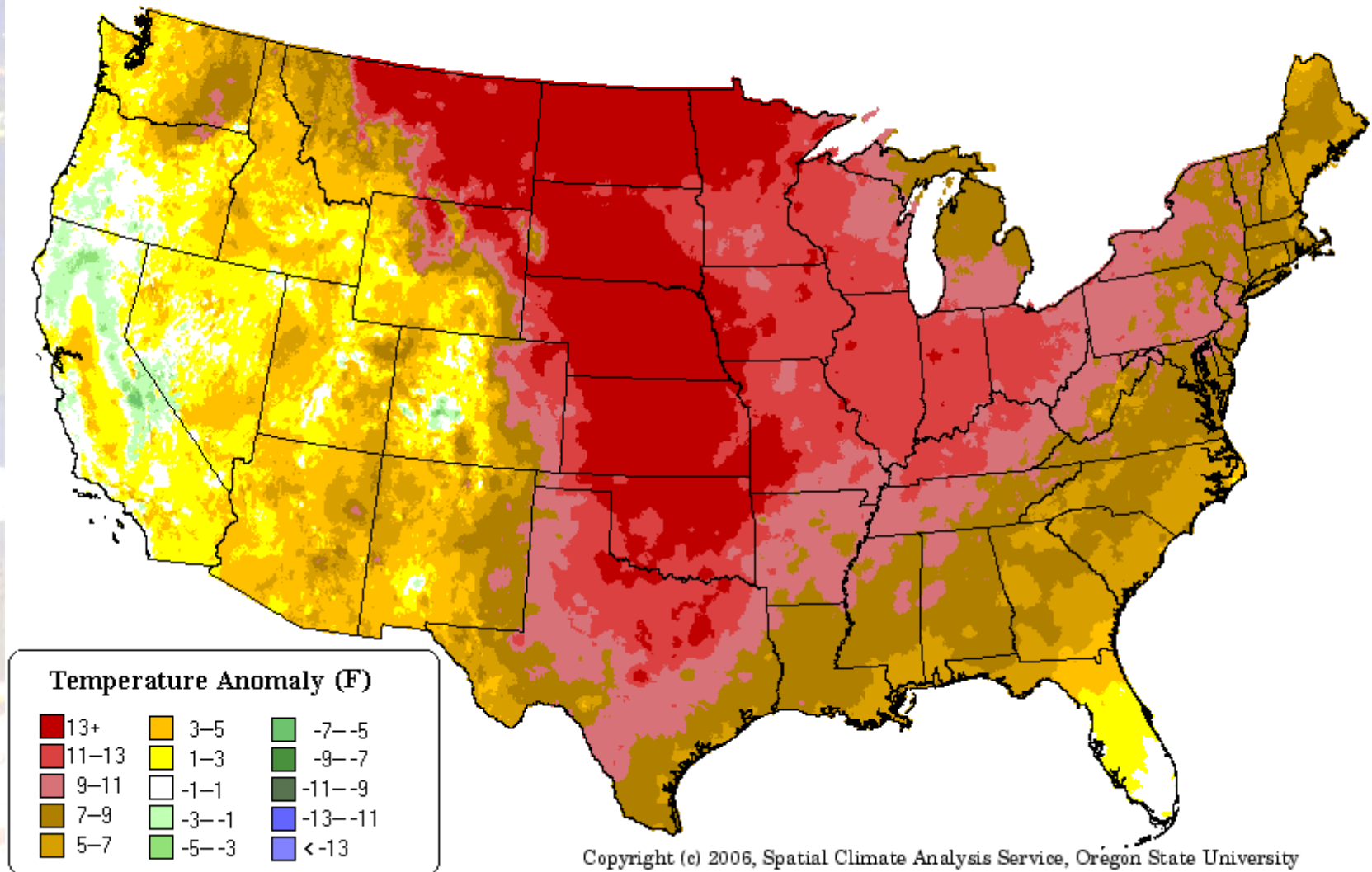
January 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Jan 2006
Final Data



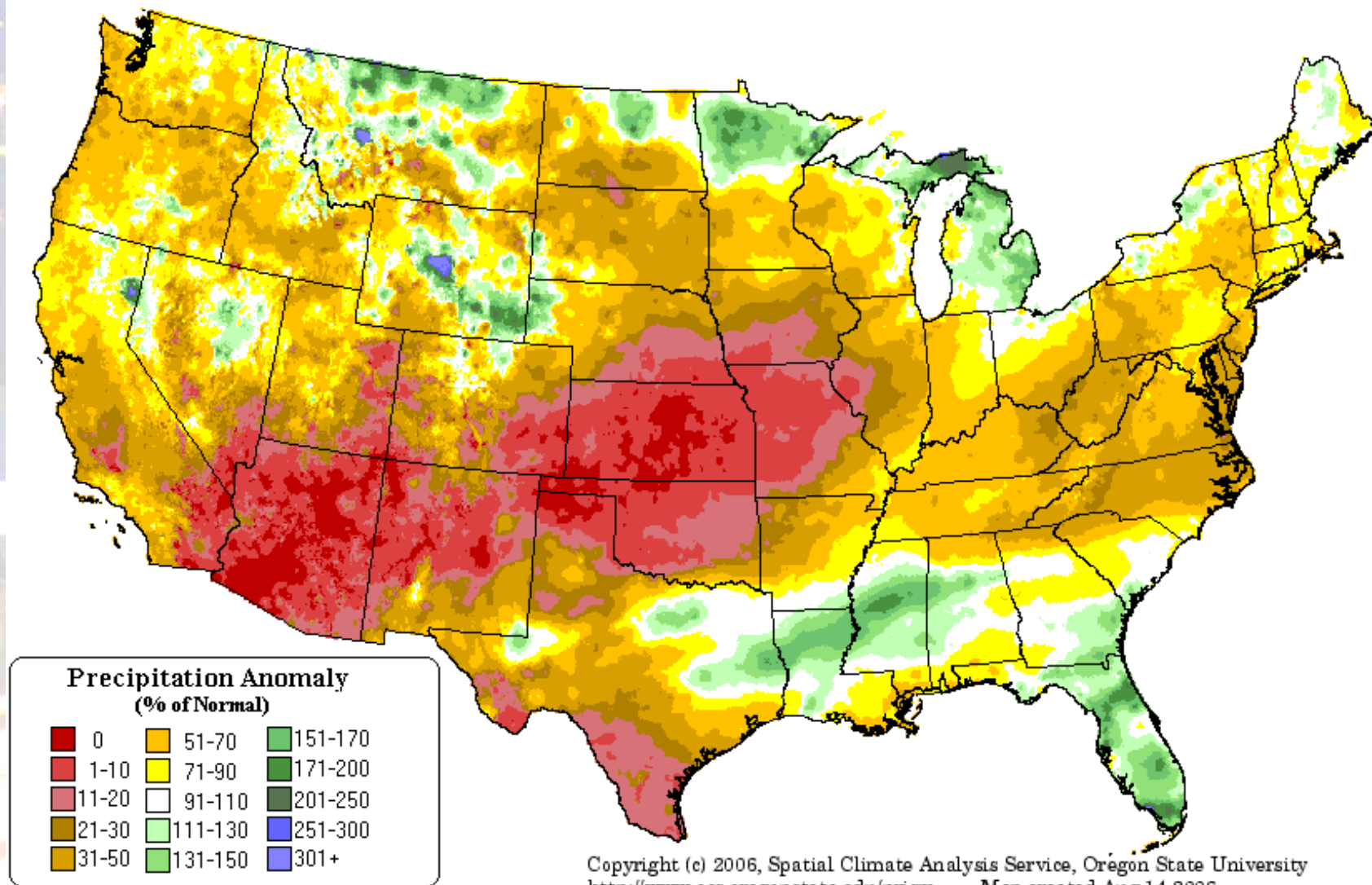
January 2006 Temperature departure from average (Prism)

Maximum Temperature Anomaly: Jan 2006
Final Data



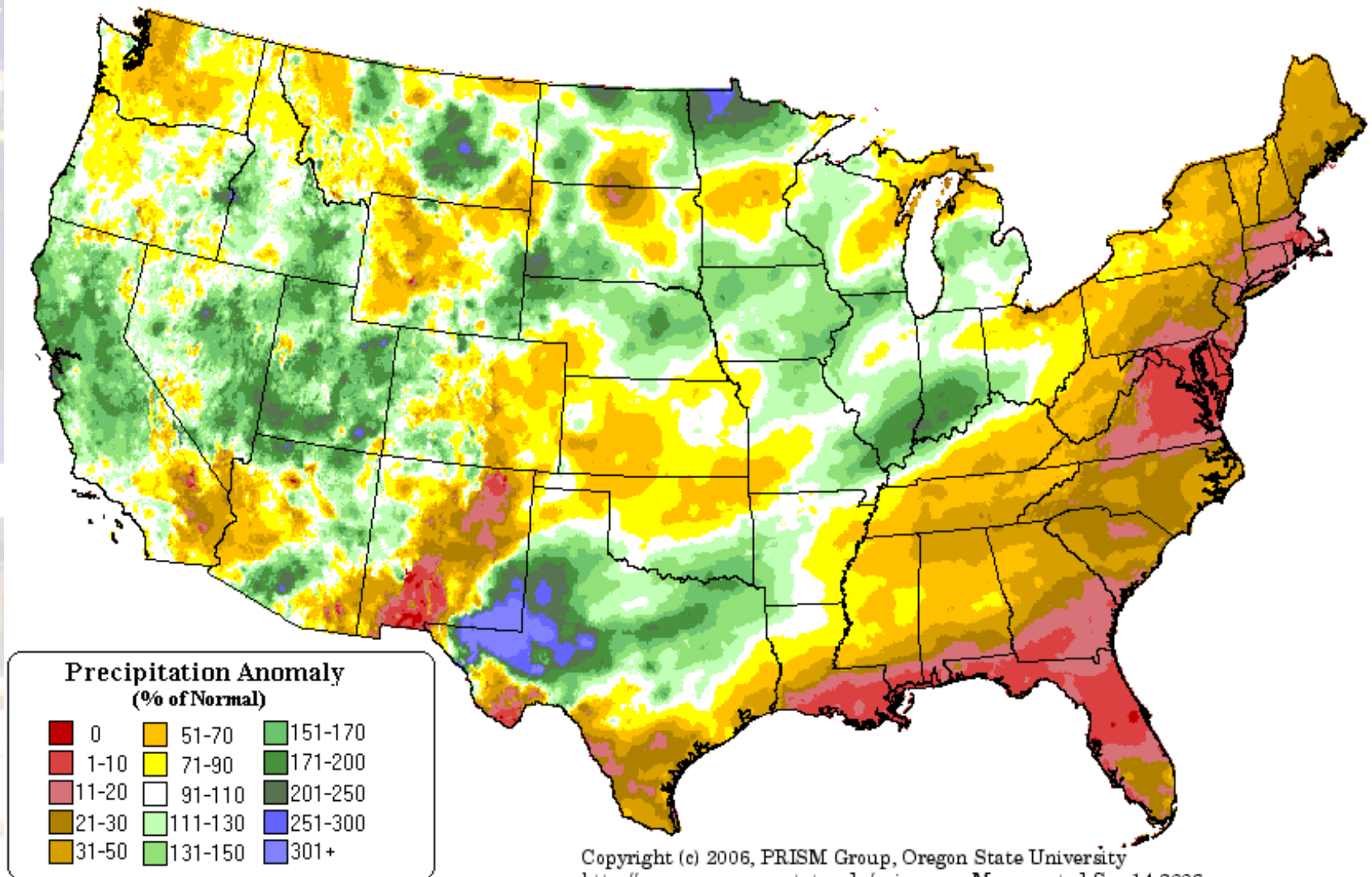
February 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Feb 2006 Final Data



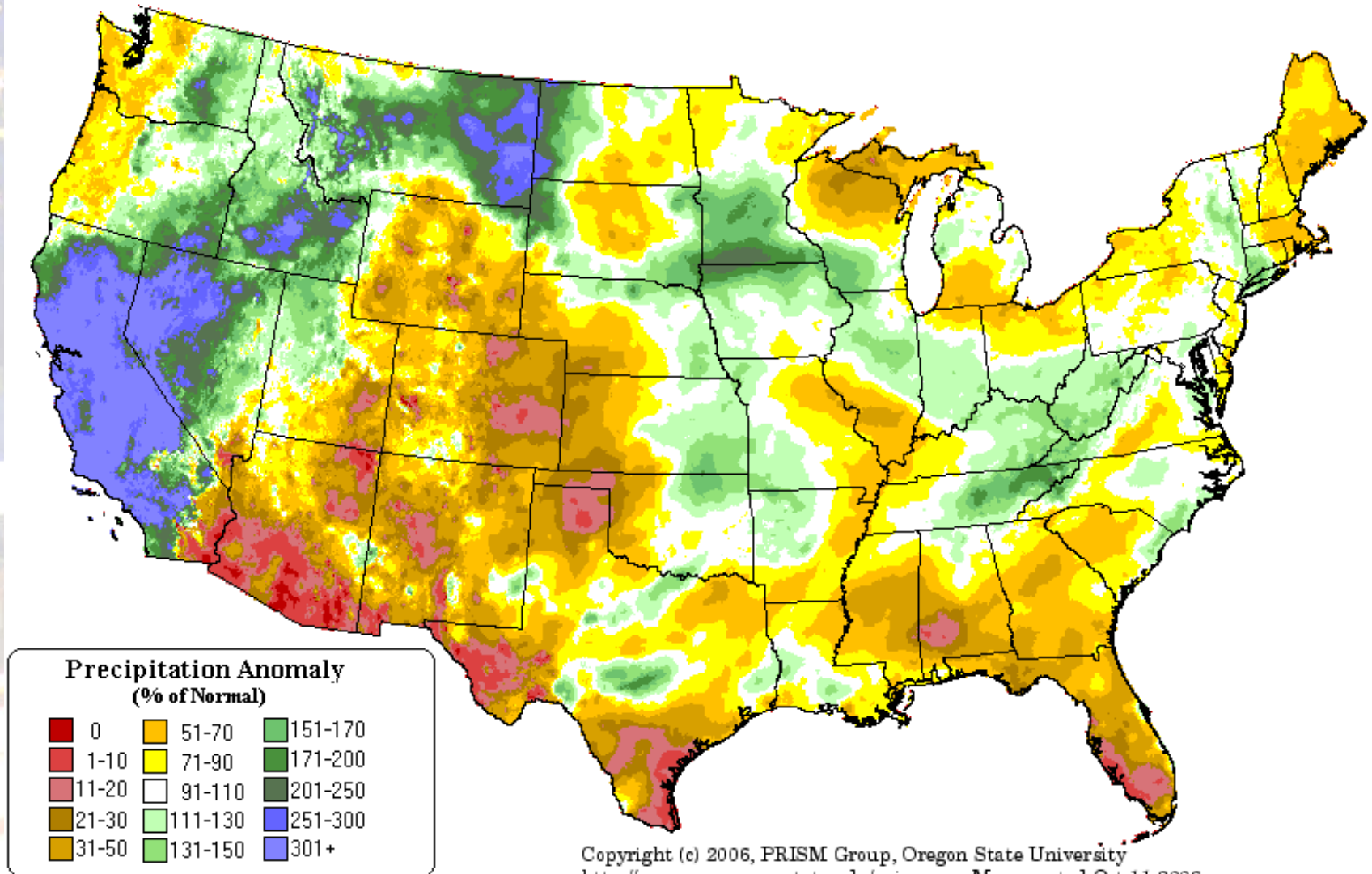
March 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Mar 2006
Final Data



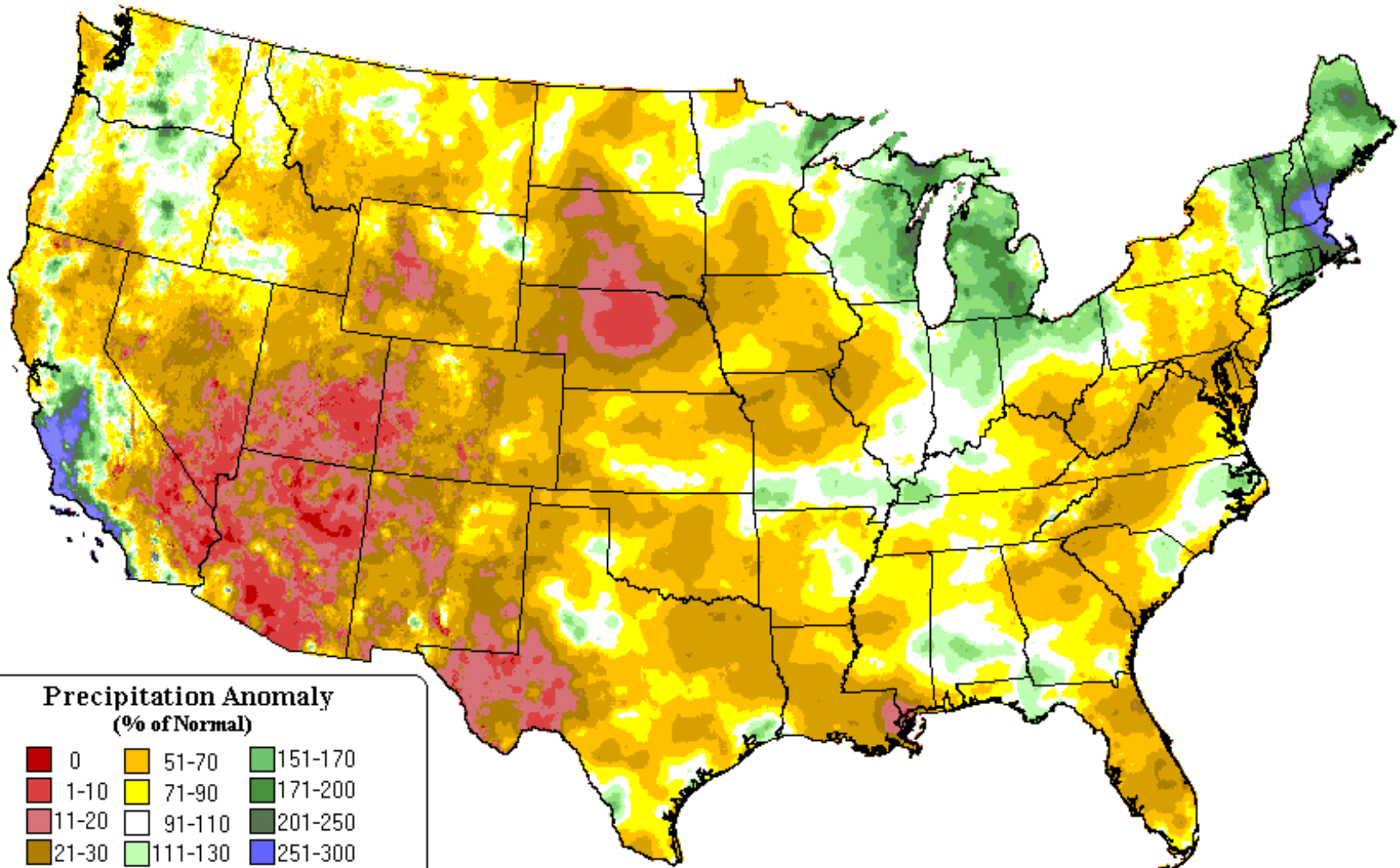
April 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Apr 2006
Final Data



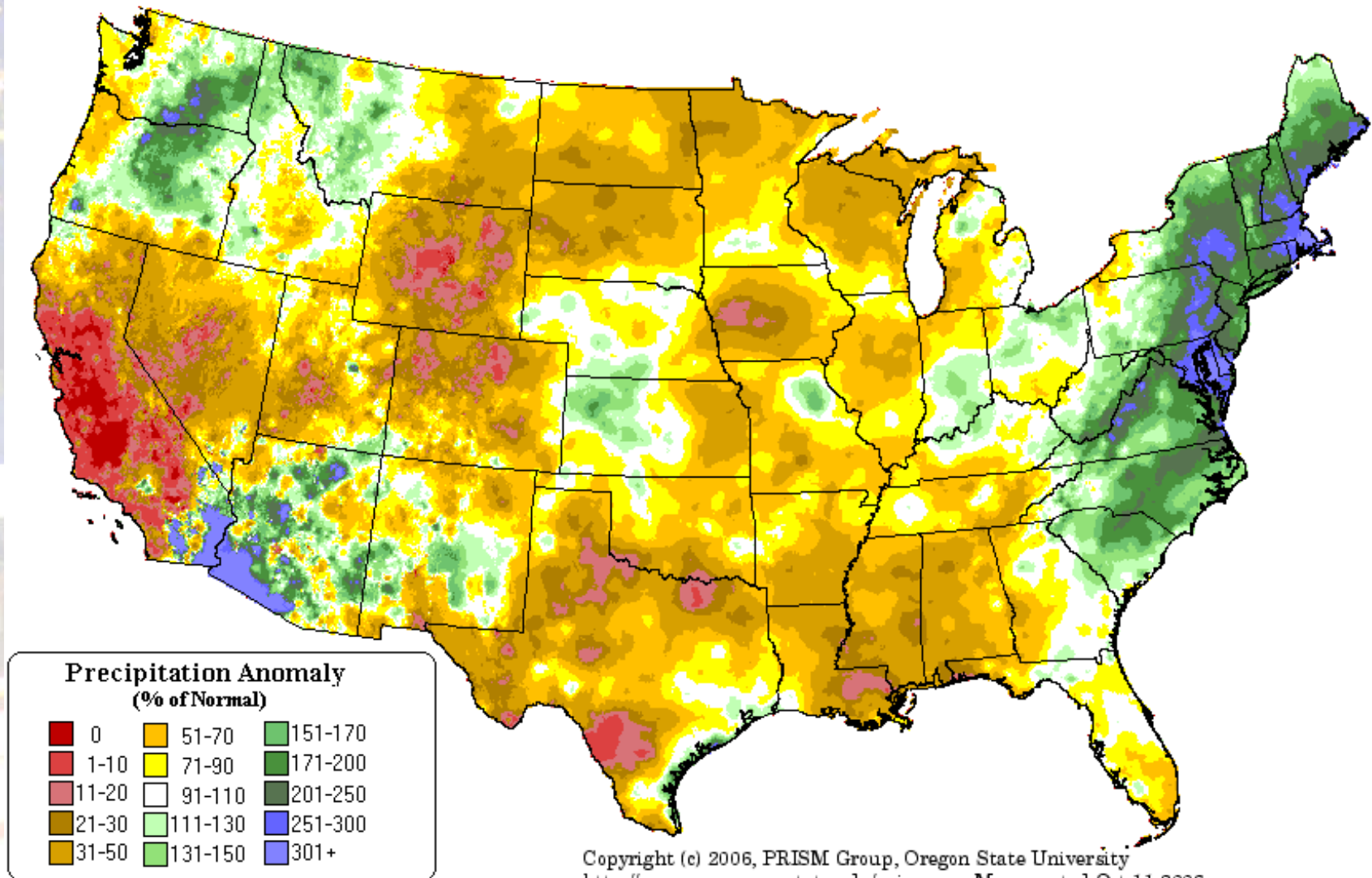
May 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: May 2006 Preliminary Data



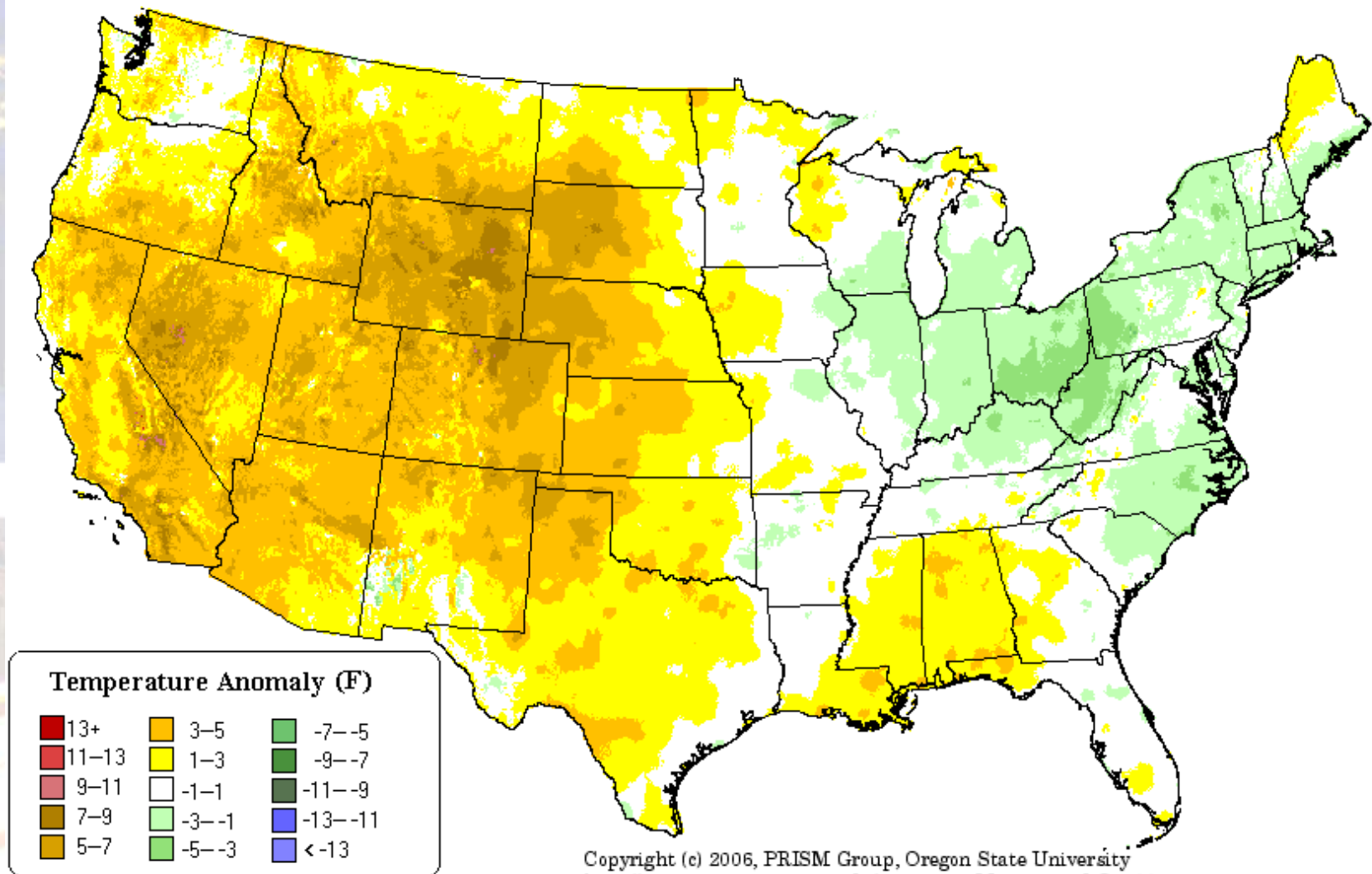
June 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Jun 2006 Provisional Data



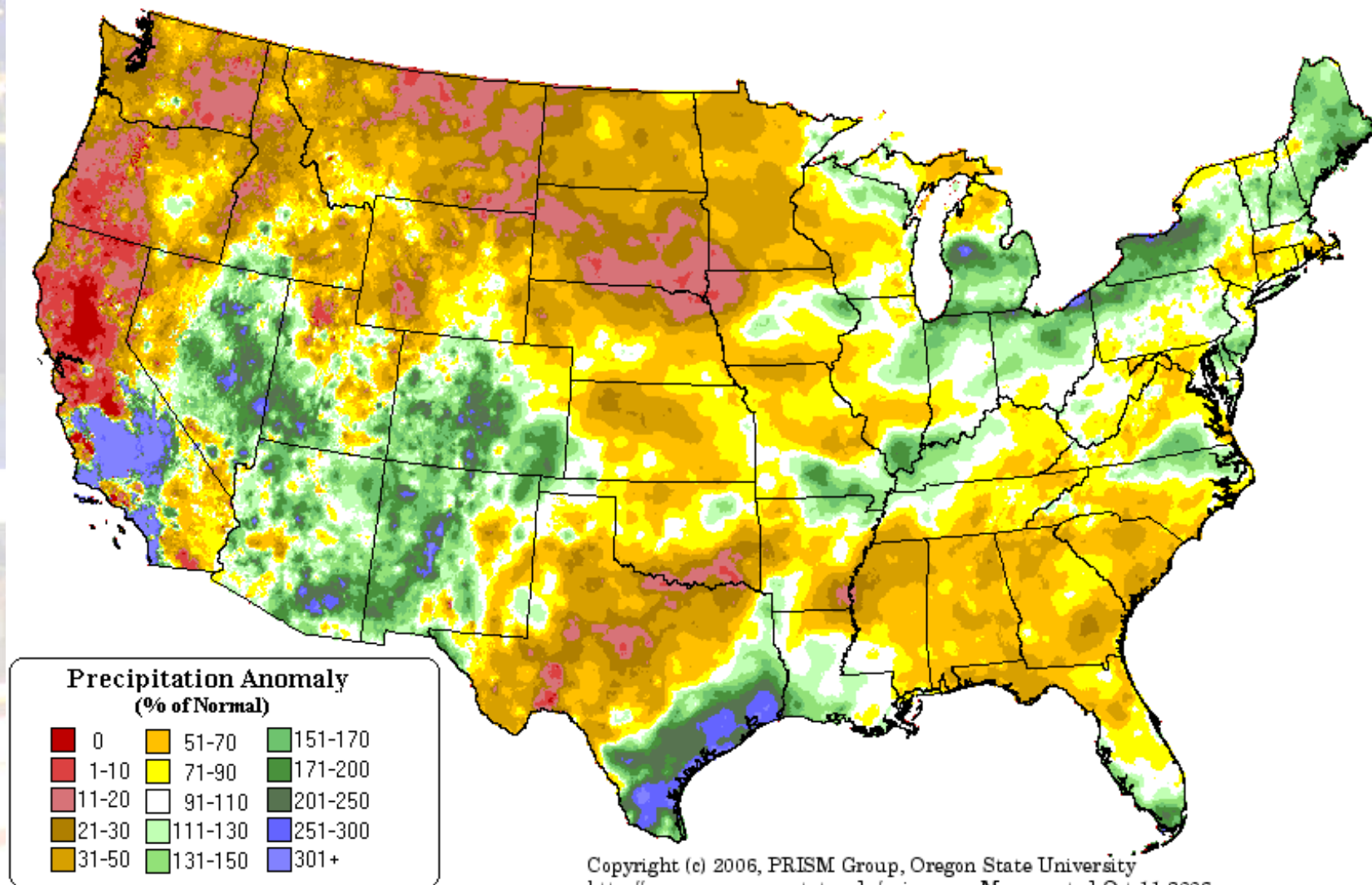
June 2006 Temperature departure from average (Prism)

Maximum Temperature Anomaly: Jun 2006
Provisional Data



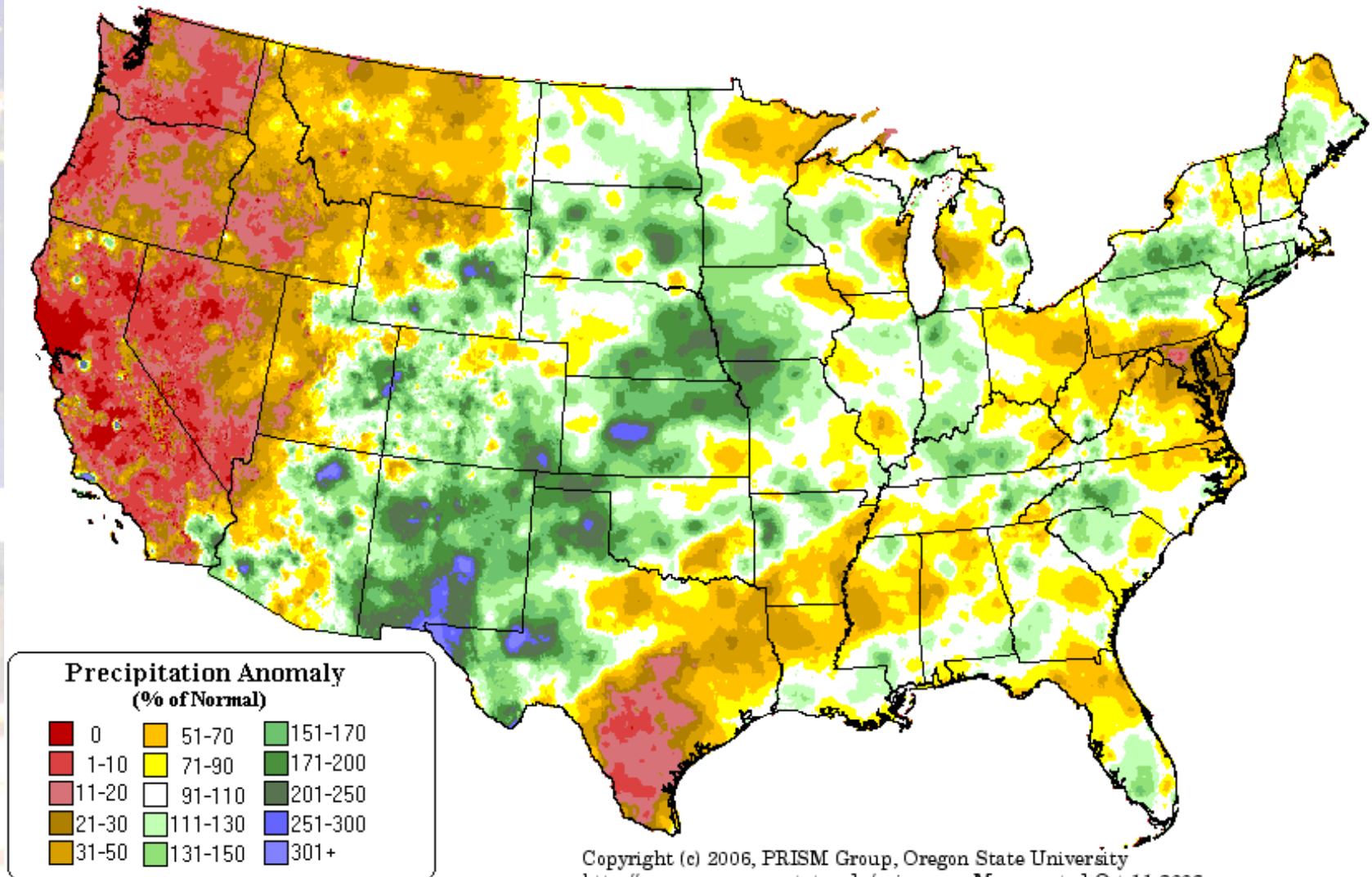
July 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Jul 2006 Provisional Data



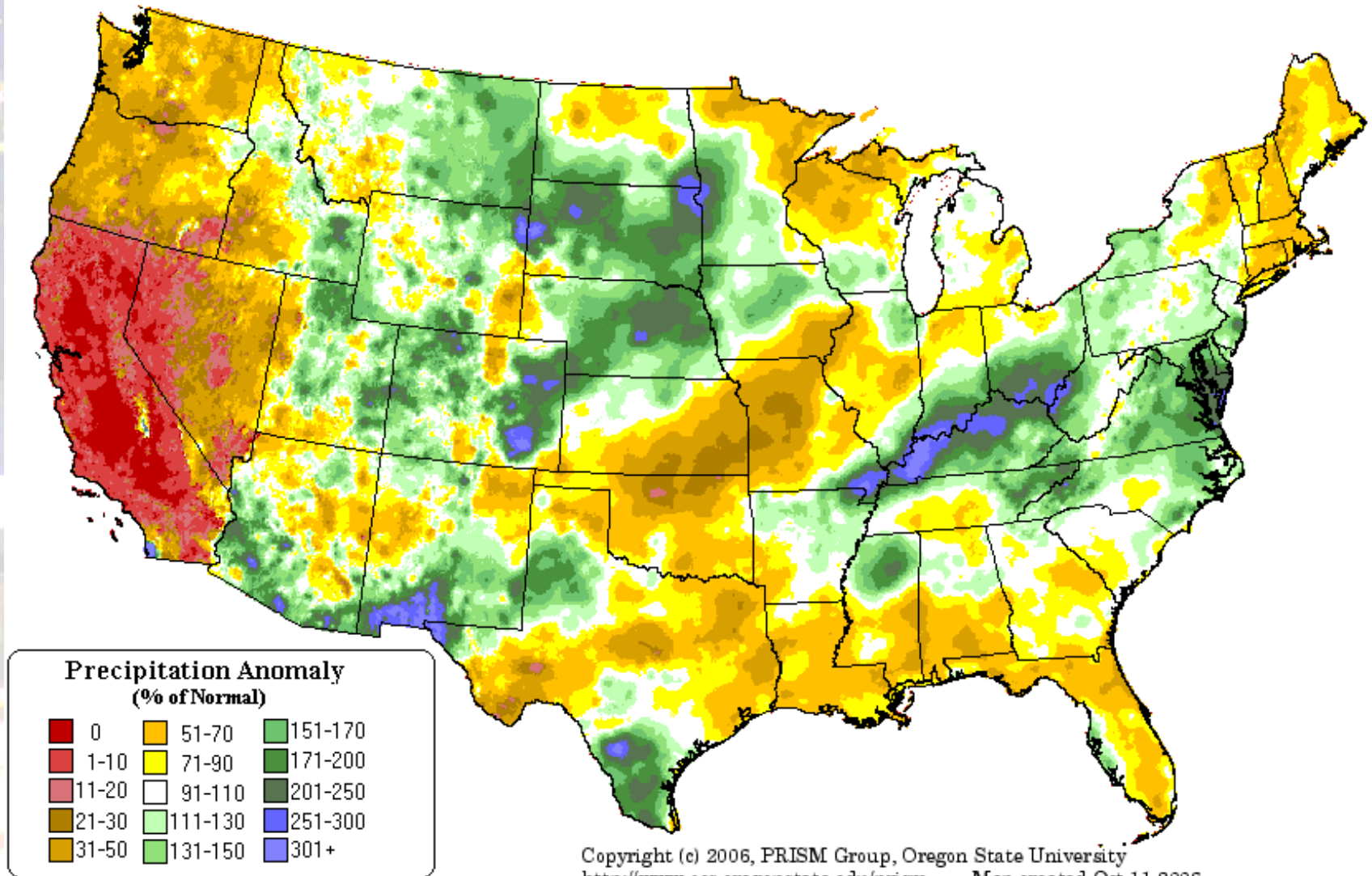
August 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Aug 2006
Provisional Data



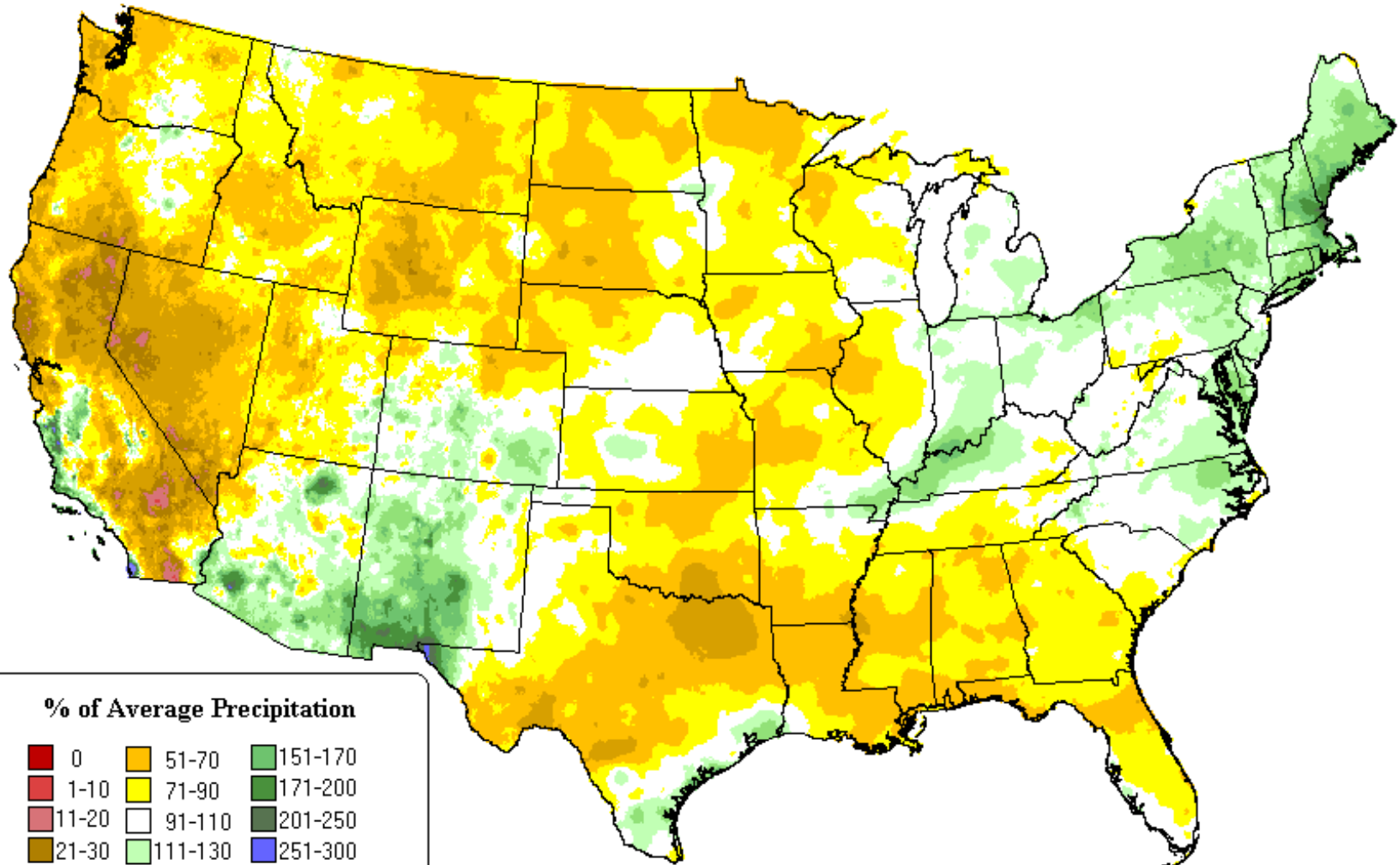
September 2006 precipitation as a percent of average (Prism)

Precipitation Anomaly: Sep 2006
Provisional Data



Summer 2006 (May–Sep) precipitation as a percent of average (Prism)

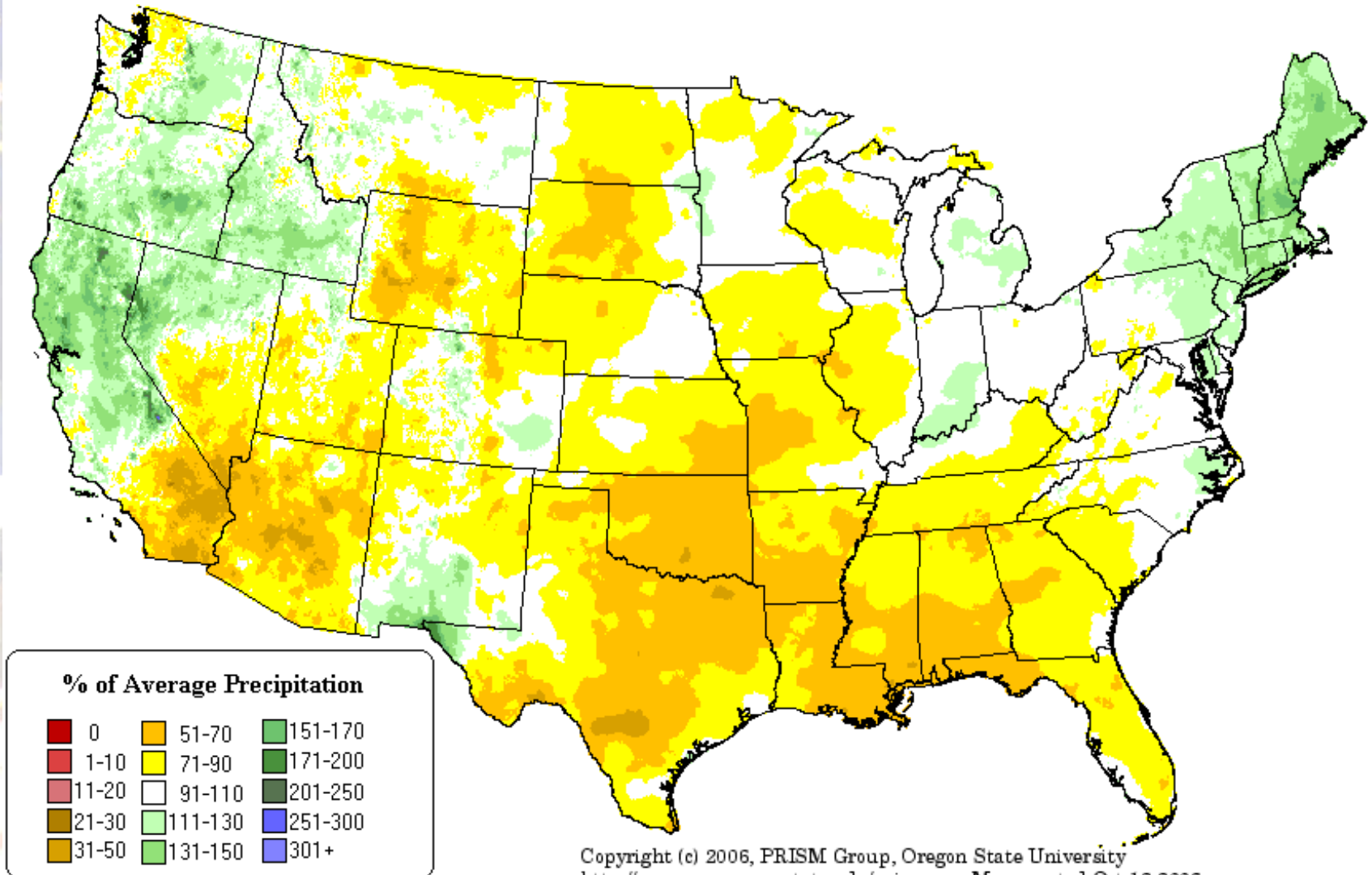
5-month Percent of Average Precipitation: Sep 2006
Provisional Data



Copyright (c) 2006, PRISM Group, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Oct 12 2006

Water Year 2006 precipitation as a percent of average (Prism)

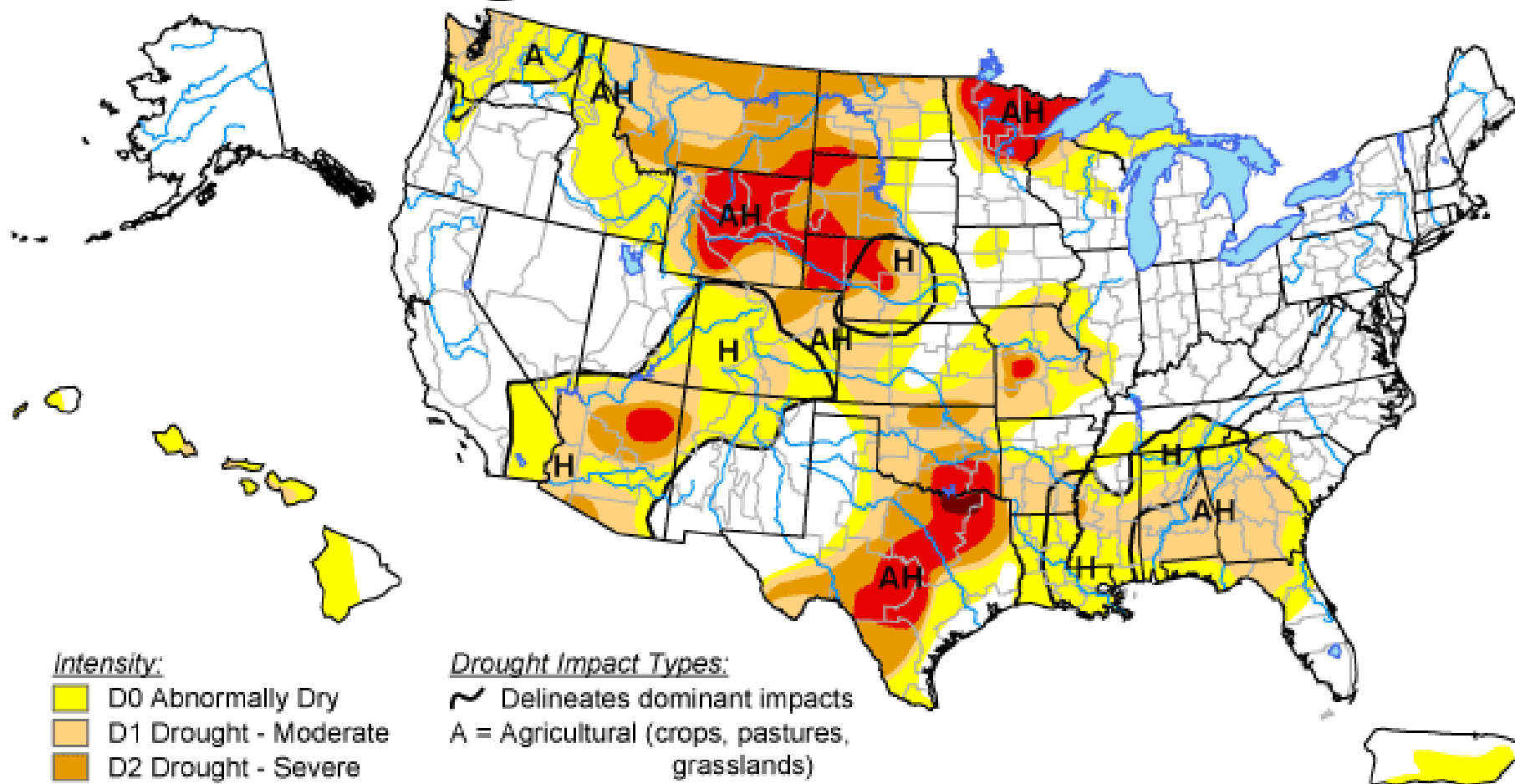
12-month Percent of Average Precipitation: Sep 2006
Provisional Data



U.S. Drought Monitor

October 3, 2006

Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



Released Thursday, October 5, 2006

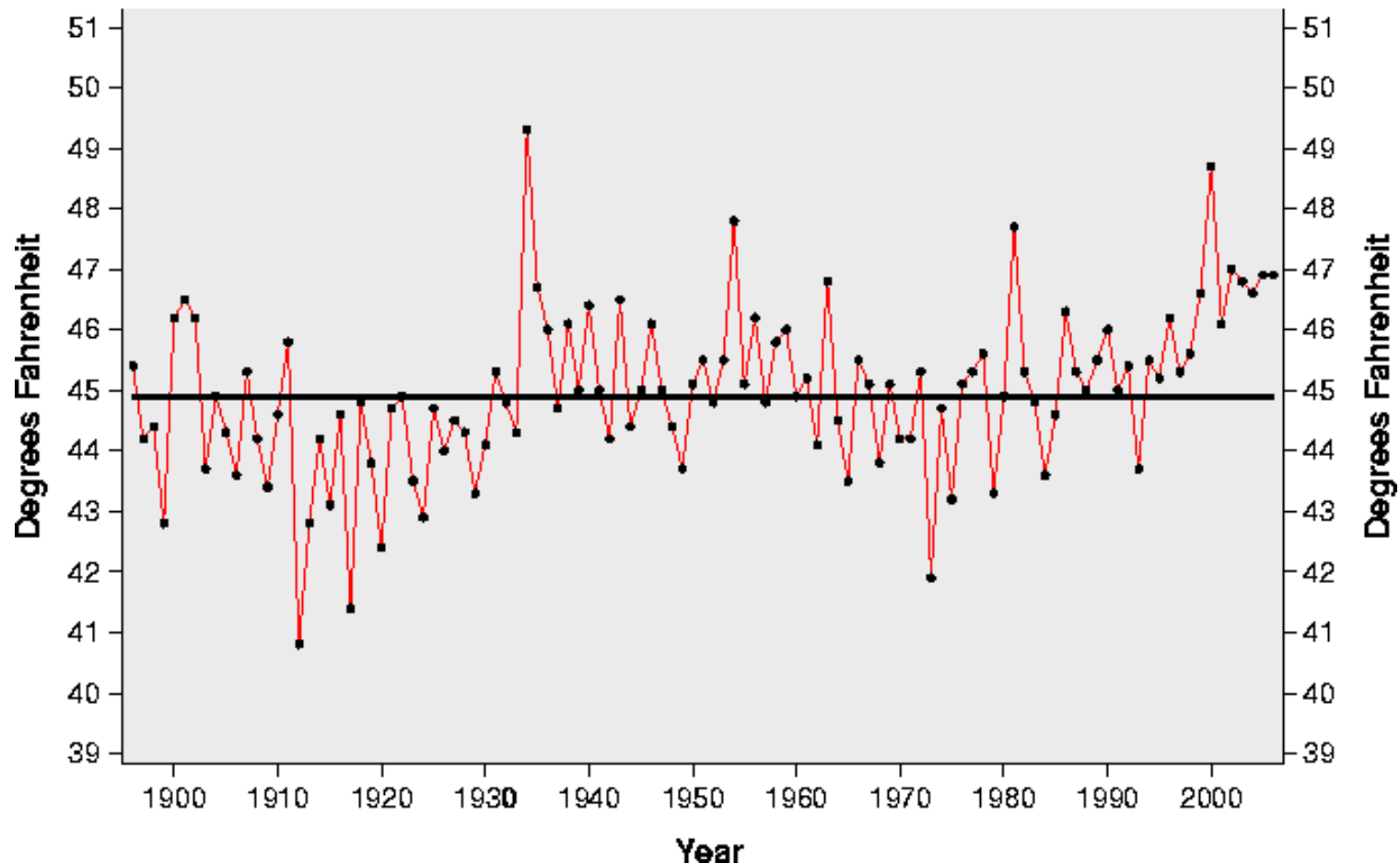
Author: Rich Tinker, Climate Prediction Center, NOAA

<http://drought.unl.edu/dm>

Overall, 2006 Water Year warmer than average again

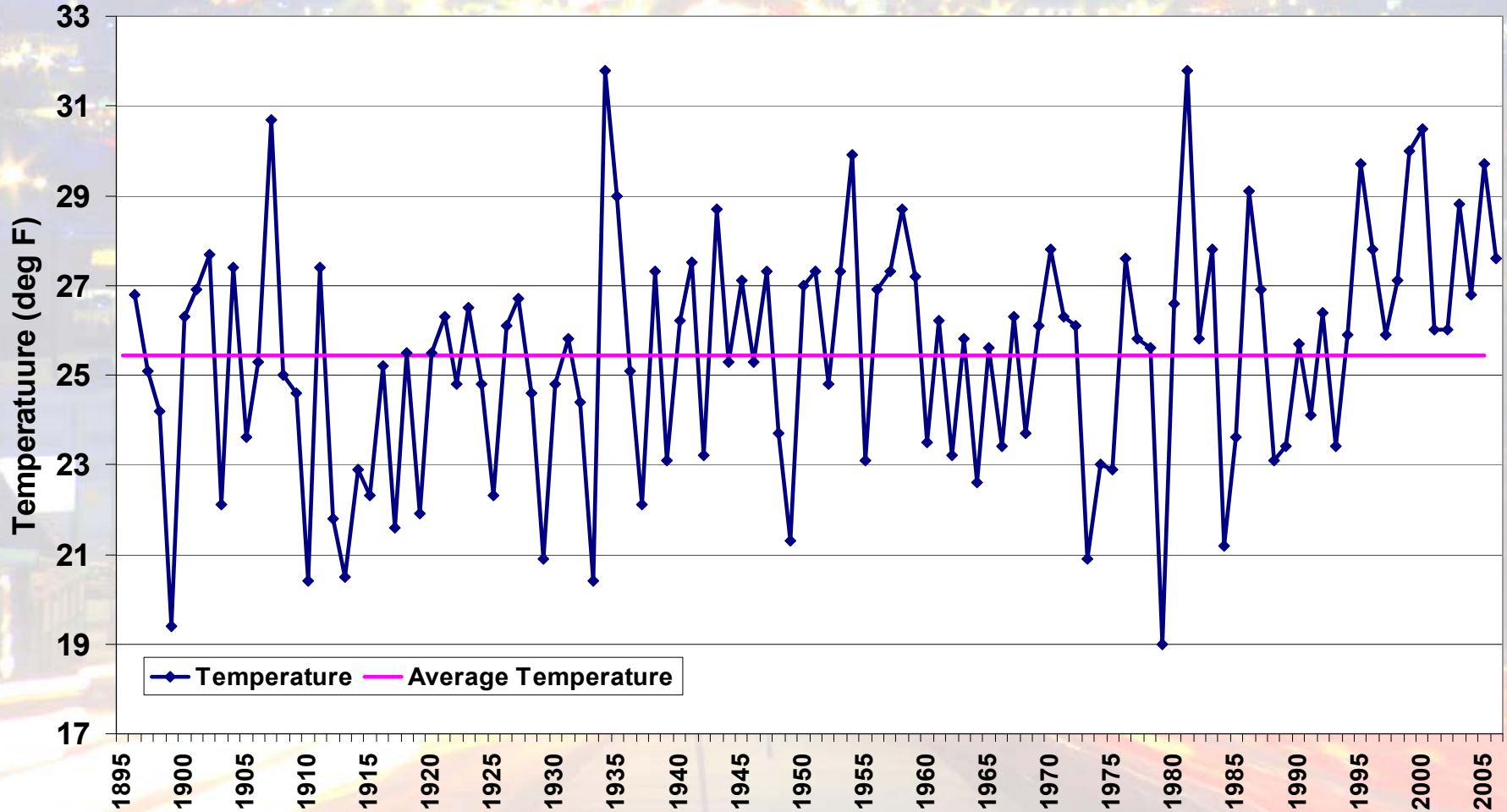
— **Actual Temperature**
— **Average Temperature**

Colorado (Oct-Sep) Average Temperatures
From 1896-2006



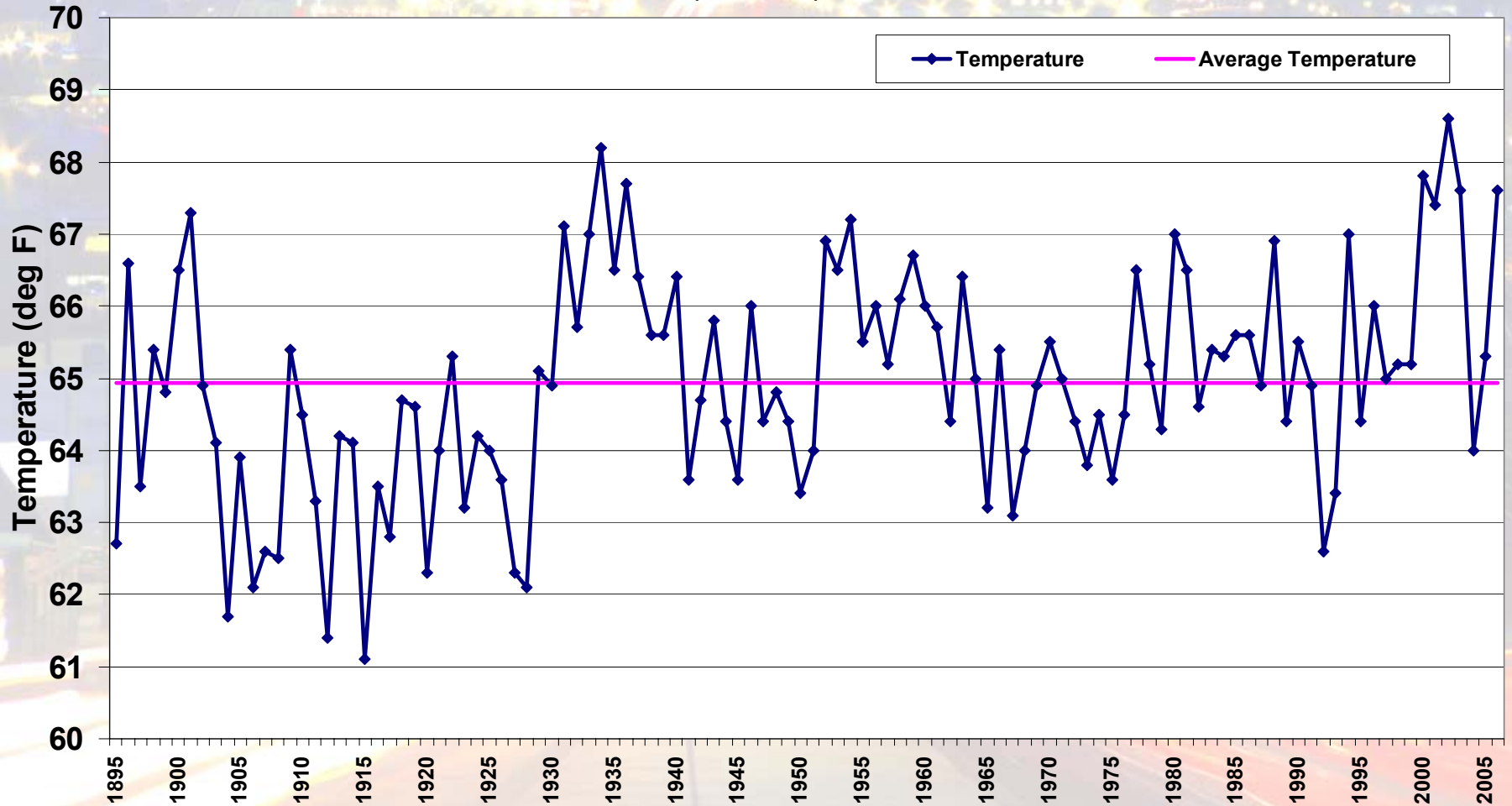
Colorado Winter Statewide Temperatures

Colorado Statewide Average Winter (Dec-Feb) Temperature
(1895-2006)



Colorado Summer Statewide Temperatures

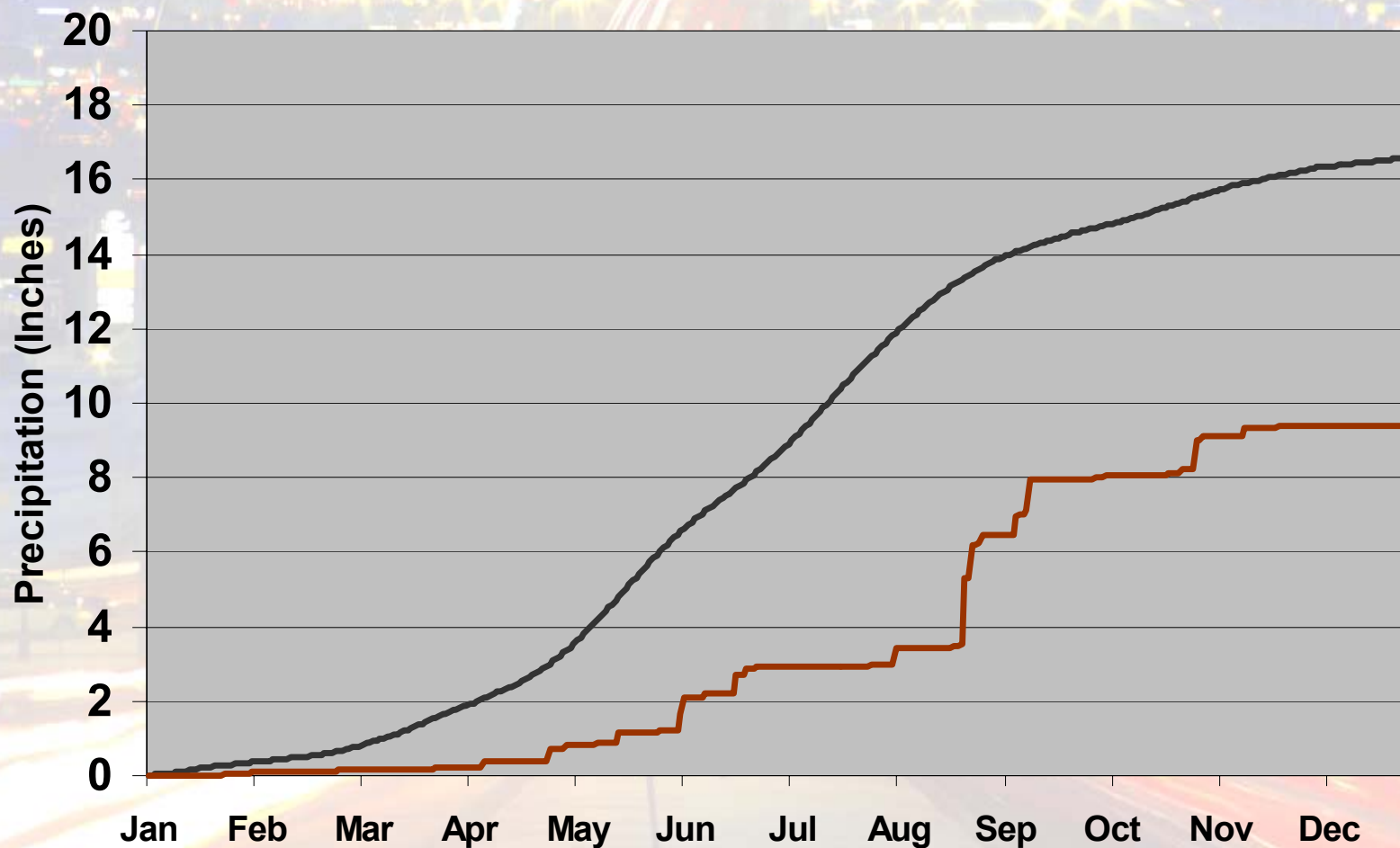
Colorado Statewide Average Summer (Jun-Aug) Temperature
(1895-2006)



2002 Akron Daily Accumulated Precipitation compared to daily average

Akron 4E

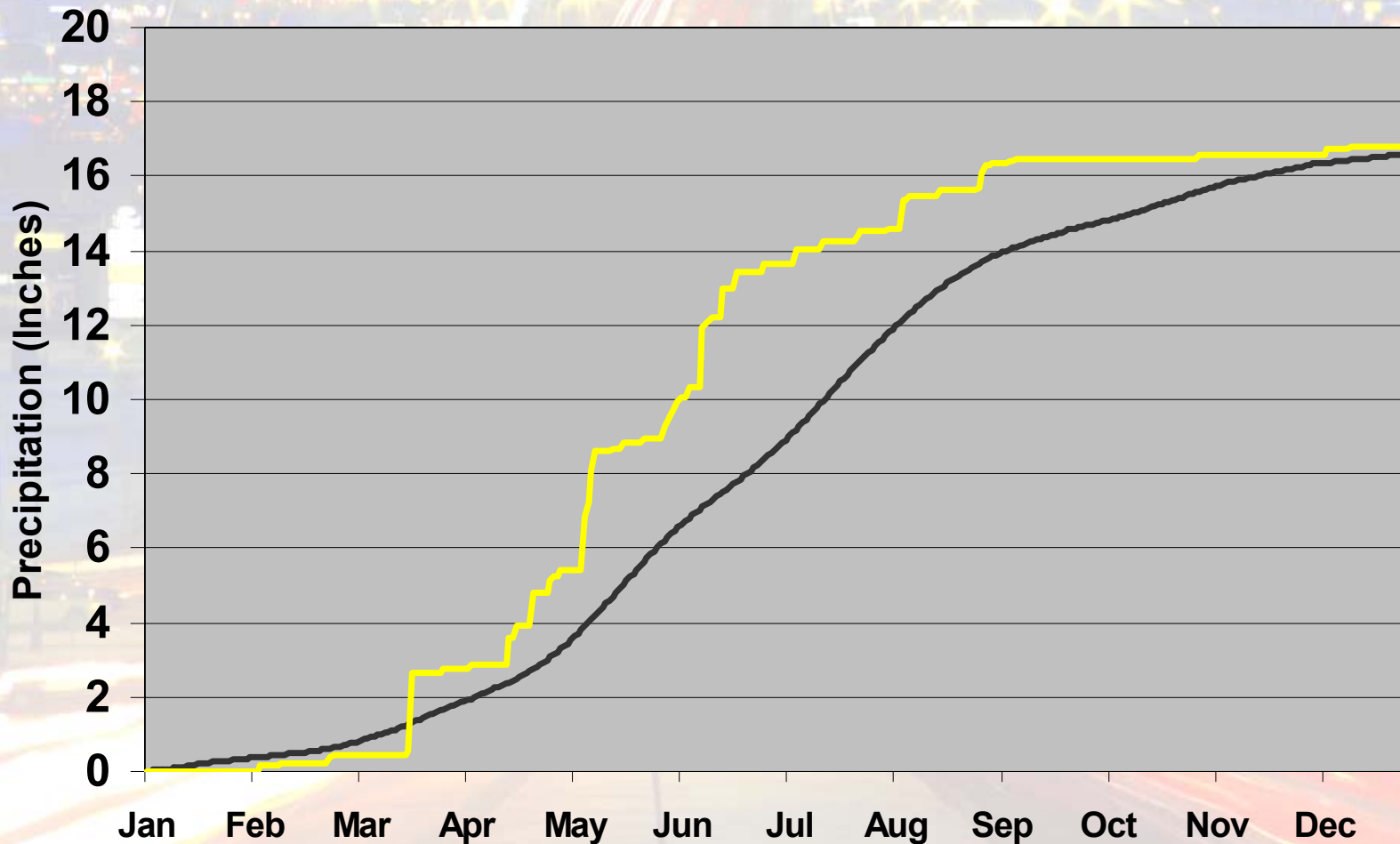
Daily Accumulated Precipitation for
Year 2002 and 30-Year Average



2003 Akron Daily Accumulated Precipitation compared to daily average

Akron 4E

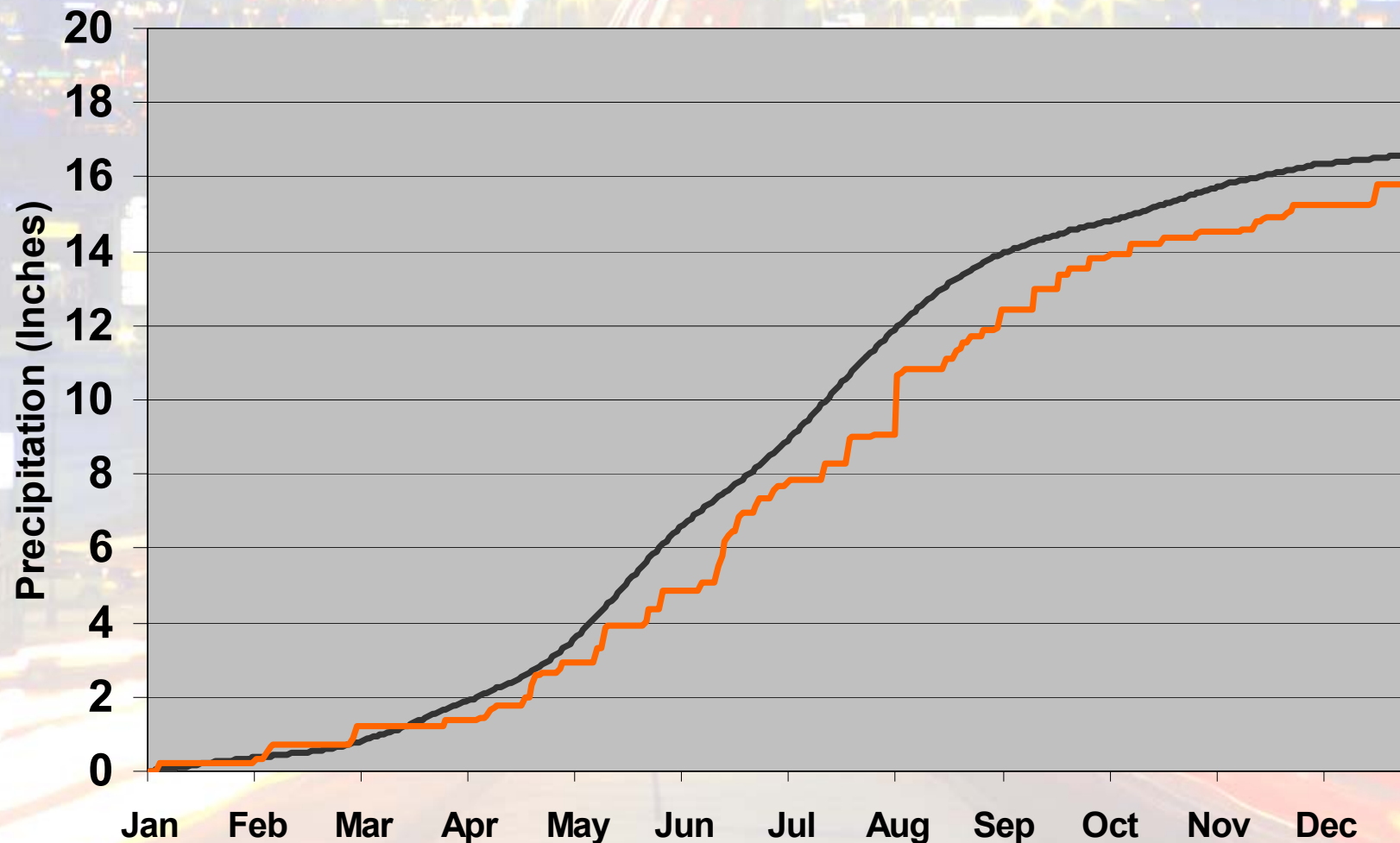
Daily Accumulated Precipitation for
Year 2003 and 30-Year Average



2004 Akron Daily Accumulated Precipitation compared to daily average

Akron 4E

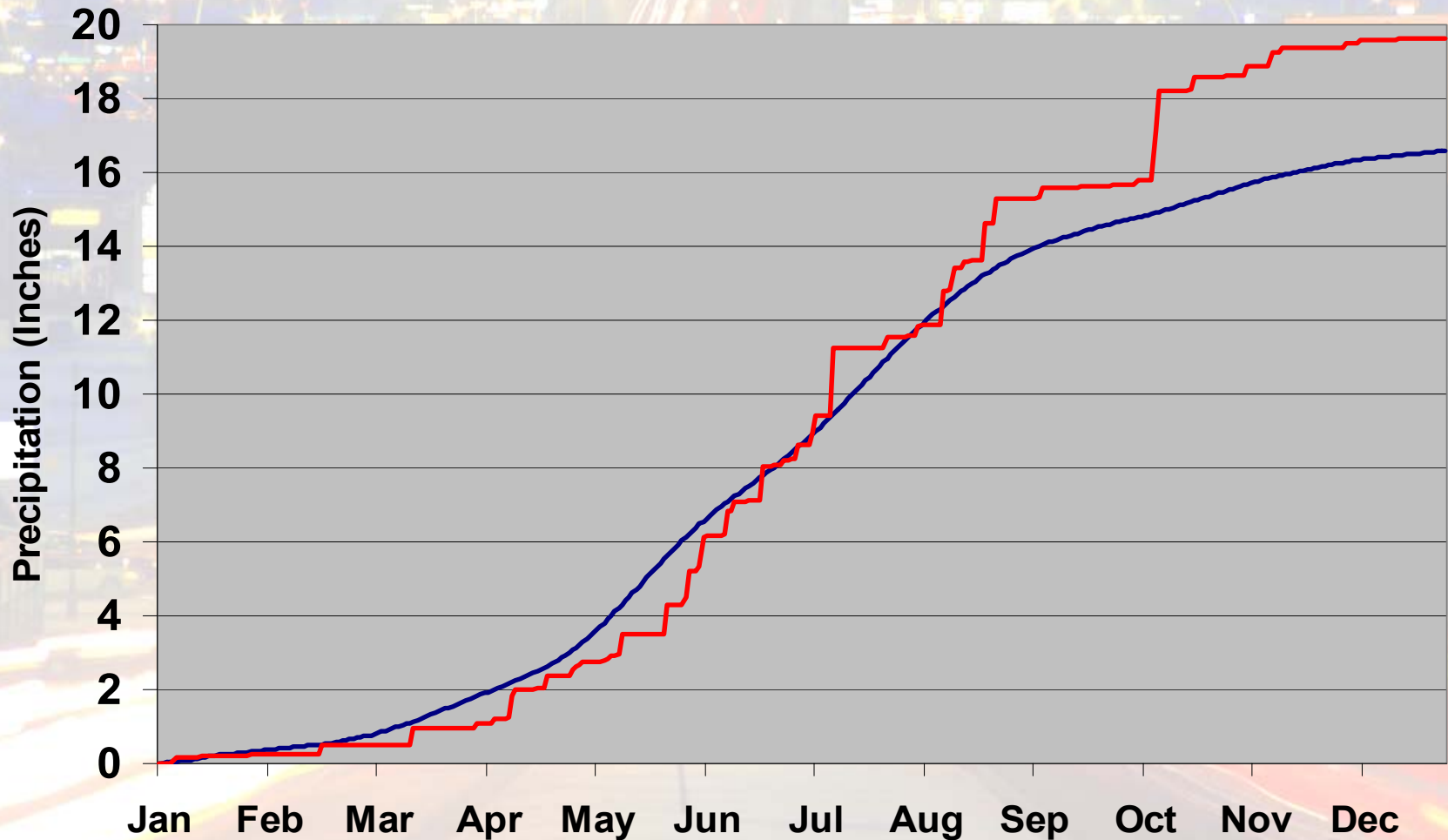
Daily Accumulated Precipitation for
Year 2004 and 30-Year Average



2005 Akron Daily Accumulated Precipitation compared to daily average

Akron 4E

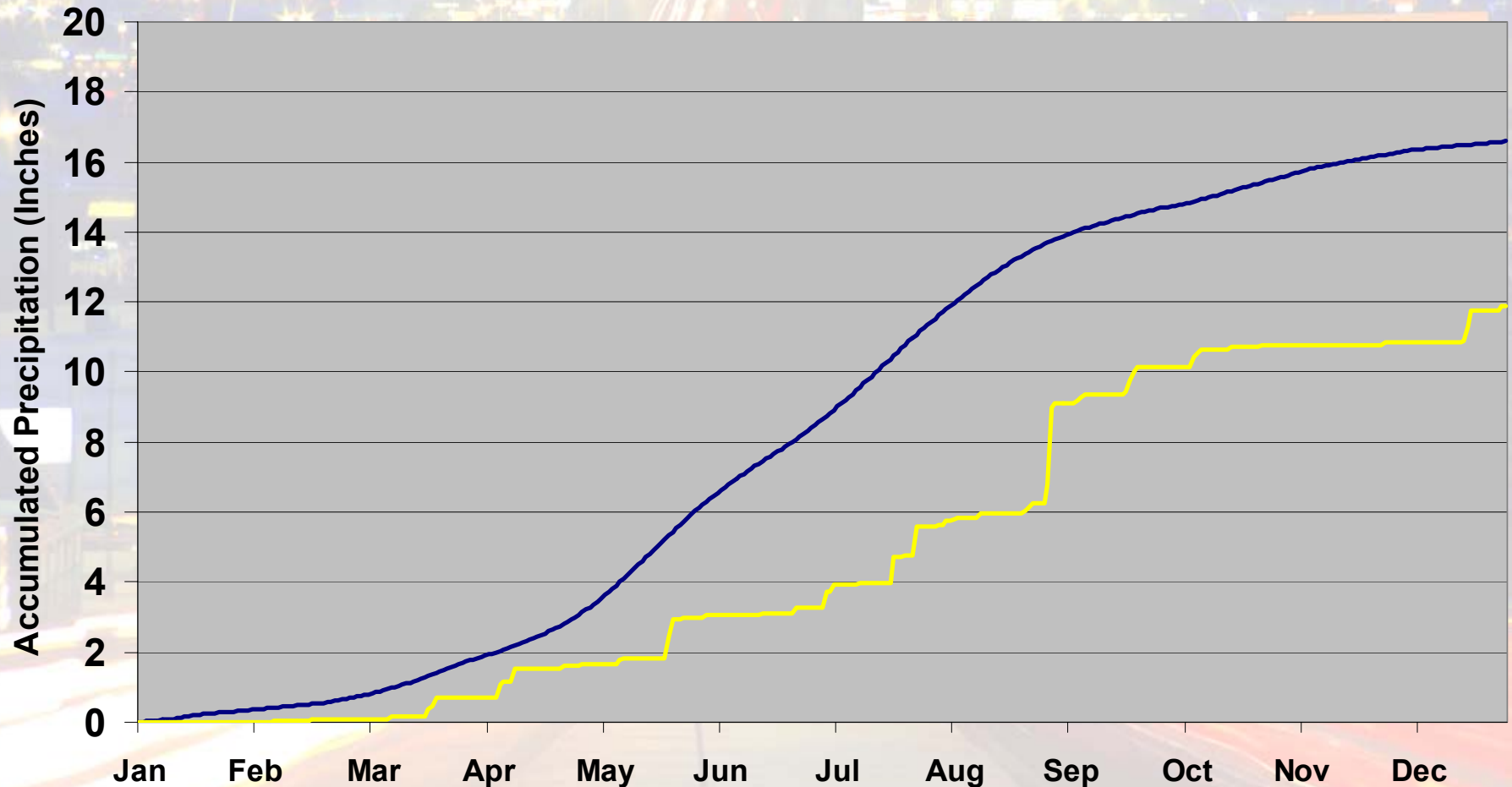
Daily Accumulated Precipitation for
Year 2005 and 30-Year Average



2006 Akron Daily Accumulated Precipitation compared to daily average

Akron 4E

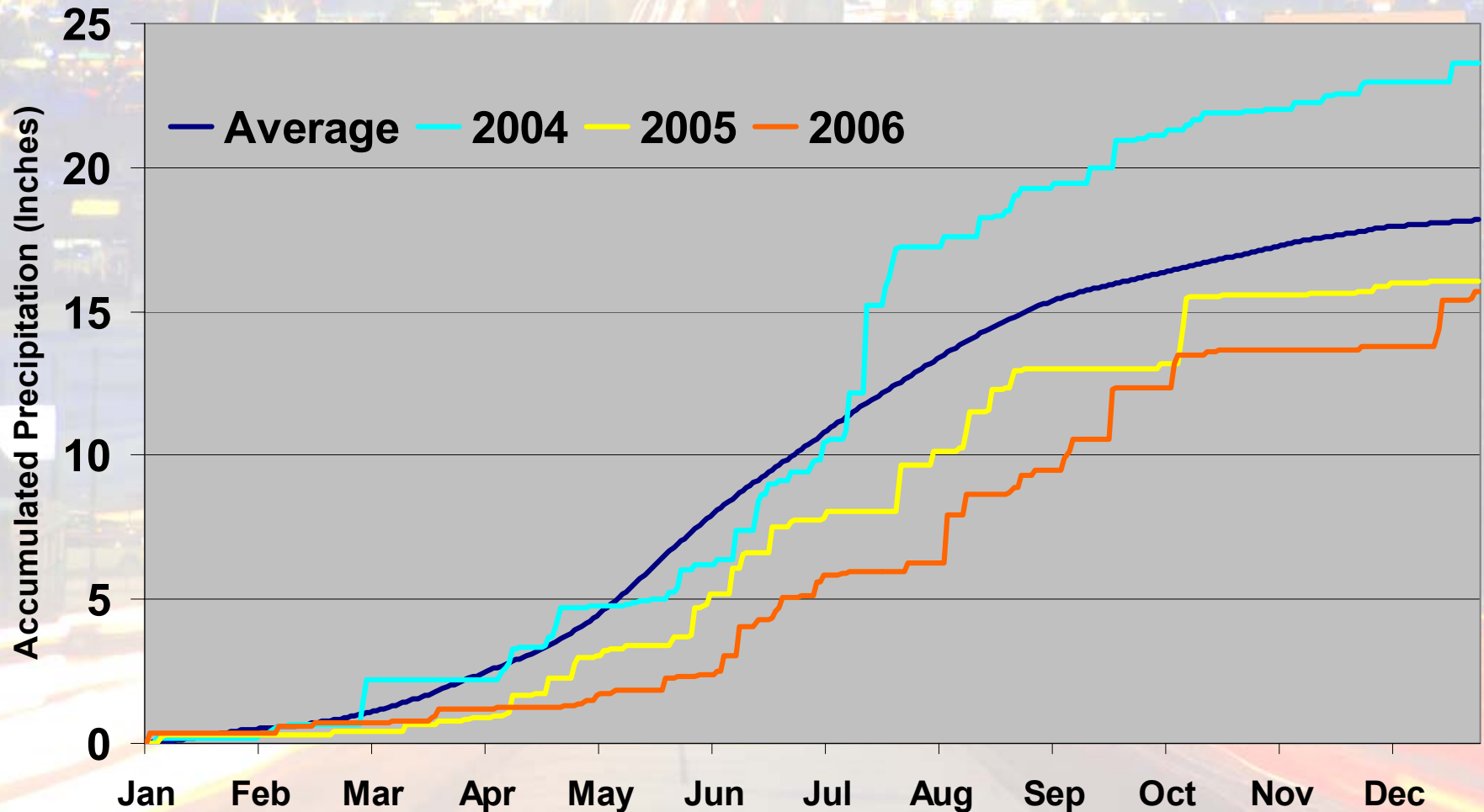
Daily Accumulated Precipitation for
Year 2006 and 30-Year Average



Holyoke 2004, 2005 & 2006 daily accumulated precipitation compared to daily average

Holyoke

Daily Accumulated Precipitation
for 2004, 2005 & 2006 and 30-year average

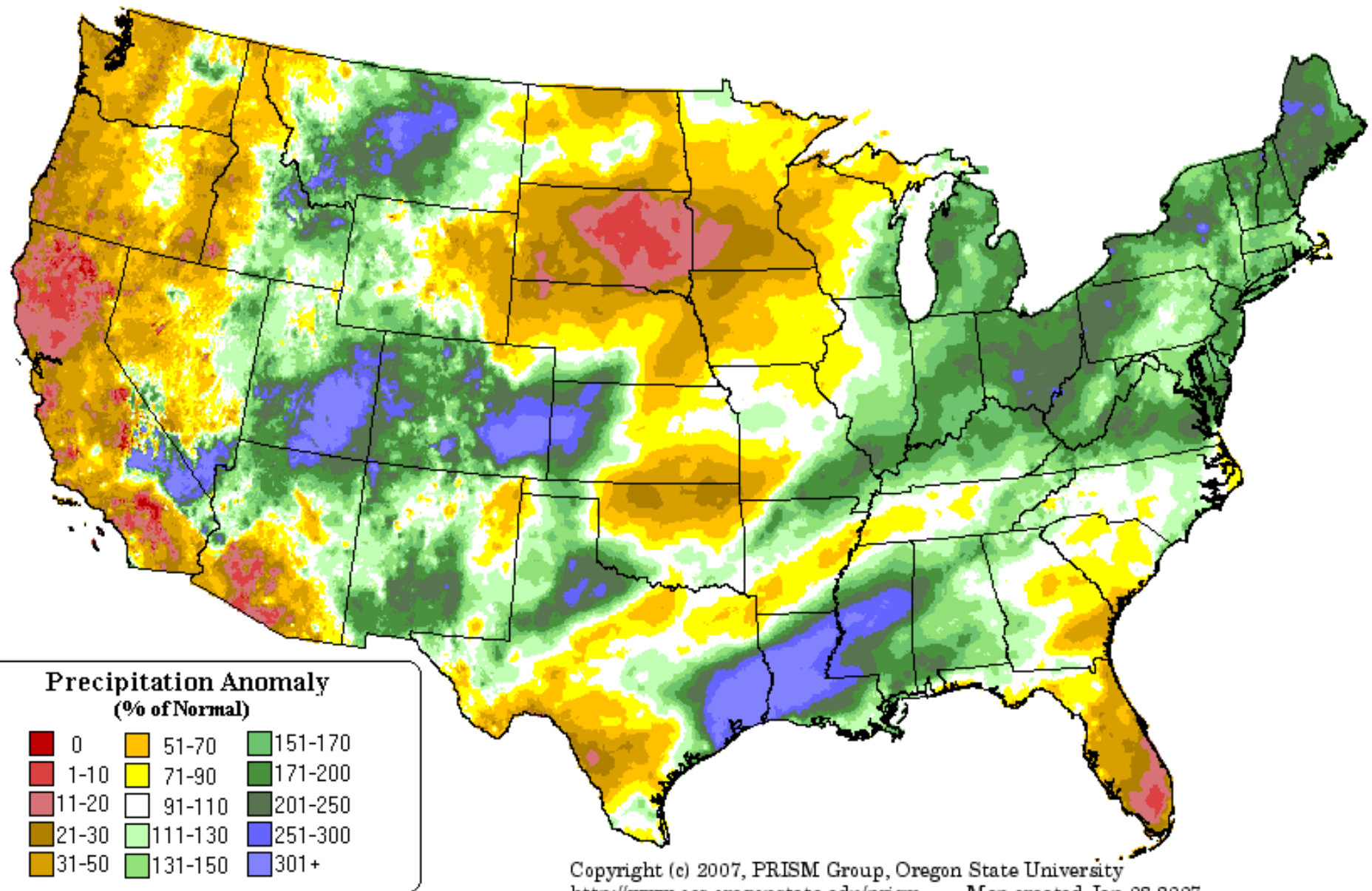


Current Status



Precipitation Anomaly: Oct 2006

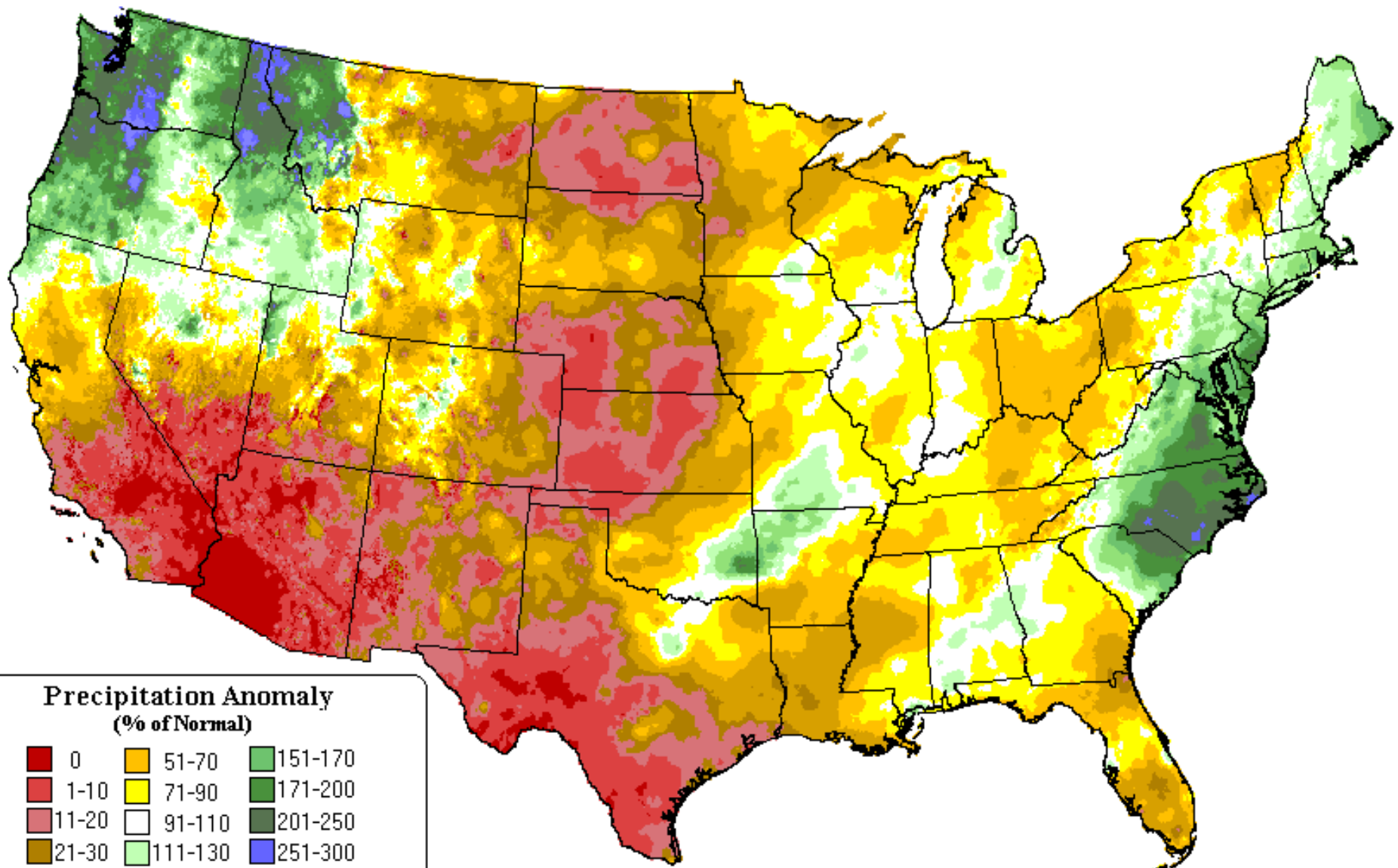
Provisional Data



Copyright (c) 2007, PRISM Group, Oregon State University
<http://www.ocs.oregonstate.edu/prism> - Map created Jan 08 2007

Precipitation Anomaly: Nov 2006

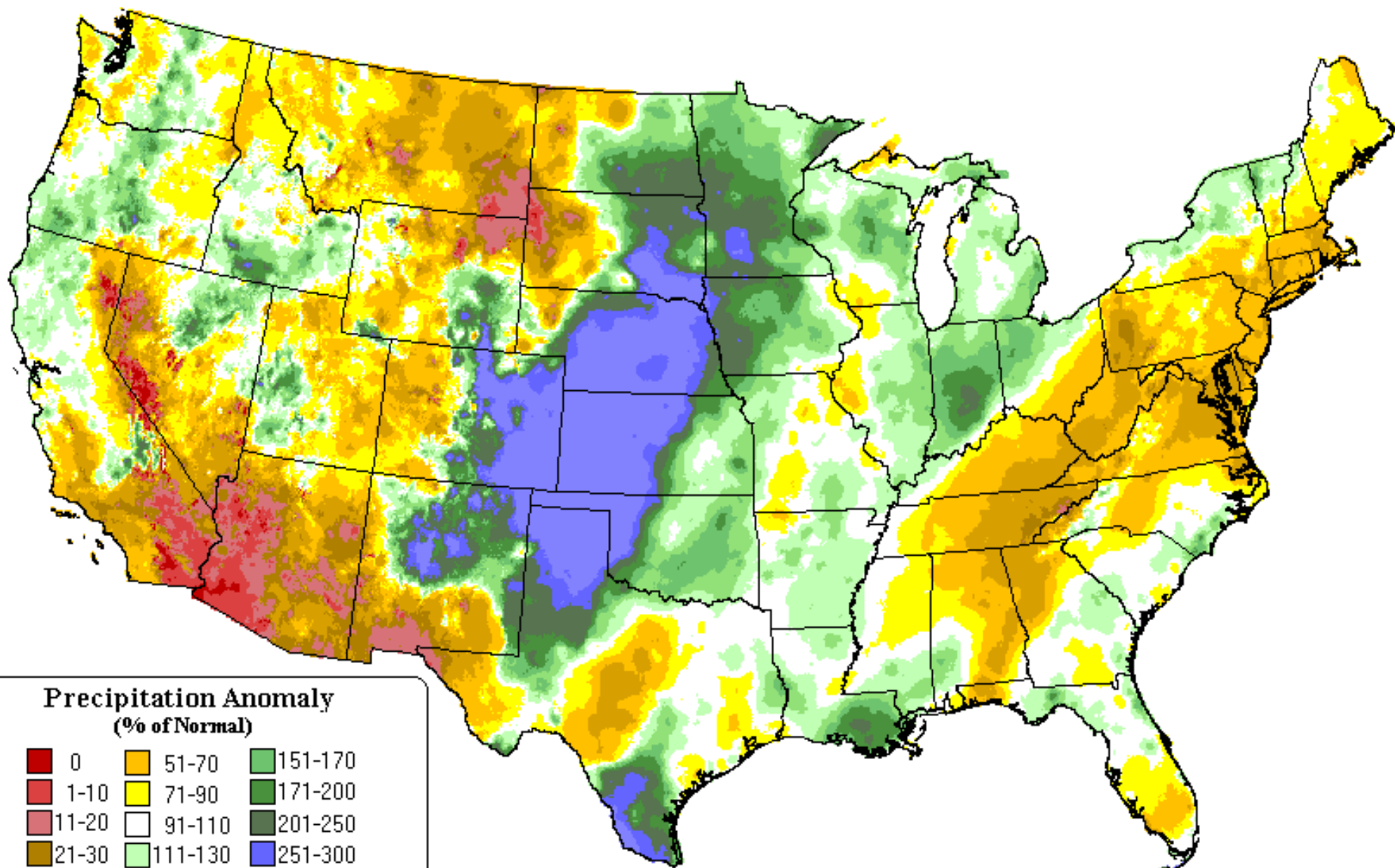
Provisional Data



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<http://www.ocs.oregonstate.edu/prism> - Map created Jan 08 2007

Precipitation Anomaly: Dec 2006

Provisional Data

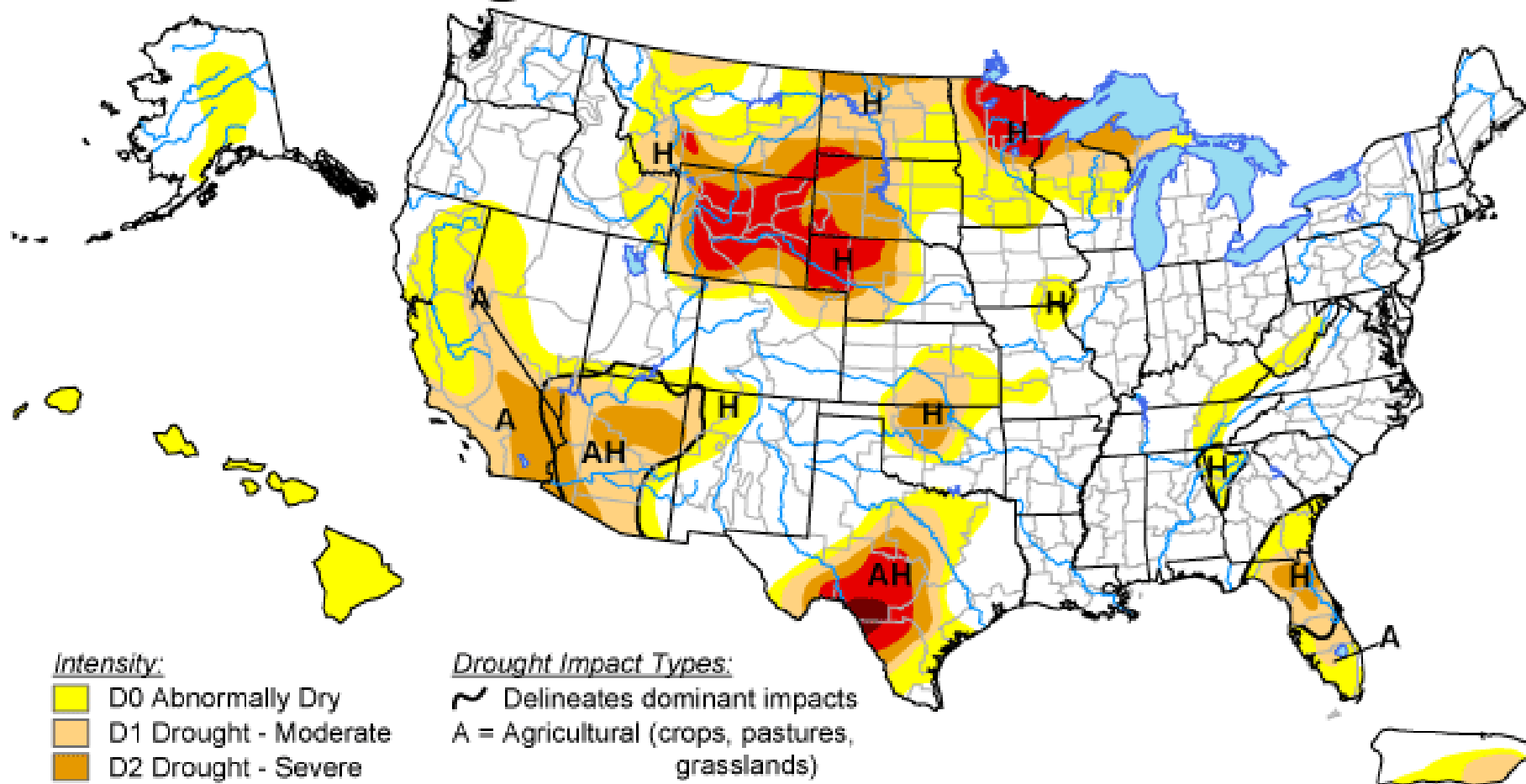


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<http://www.ocs.oregonstate.edu/prism> - Map created Jan 08 2007

U.S. Drought Monitor

January 23, 2007

Valid 7 a.m. EST



Intensity:

- Yellow D0 Abnormally Dry
- Light Orange D1 Drought - Moderate
- Orange D2 Drought - Severe
- Red D3 Drought - Extreme
- Dark Red D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

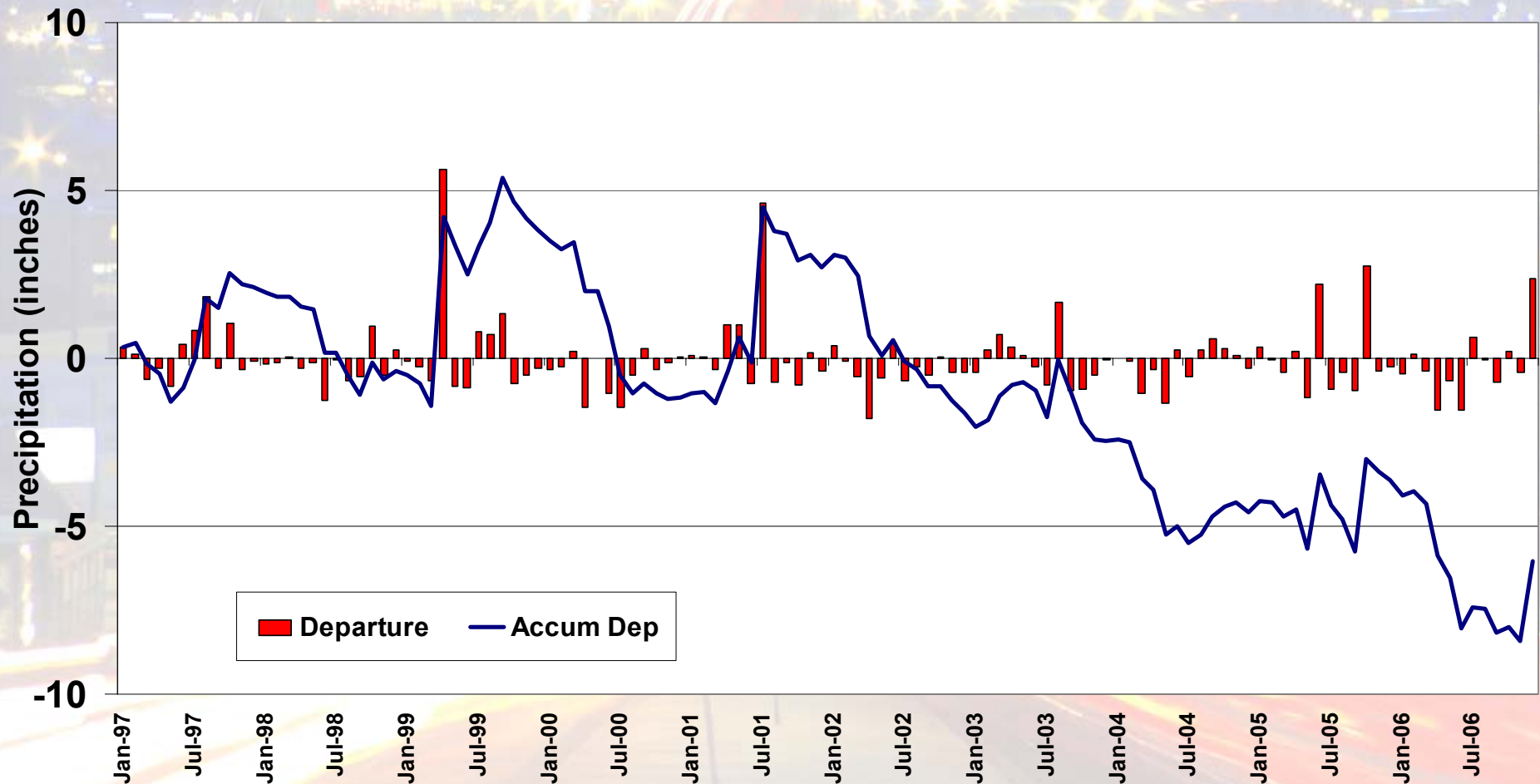


Released Thursday, January 25, 2007

Author: David Miskus, JAWF/CPC/NOAA

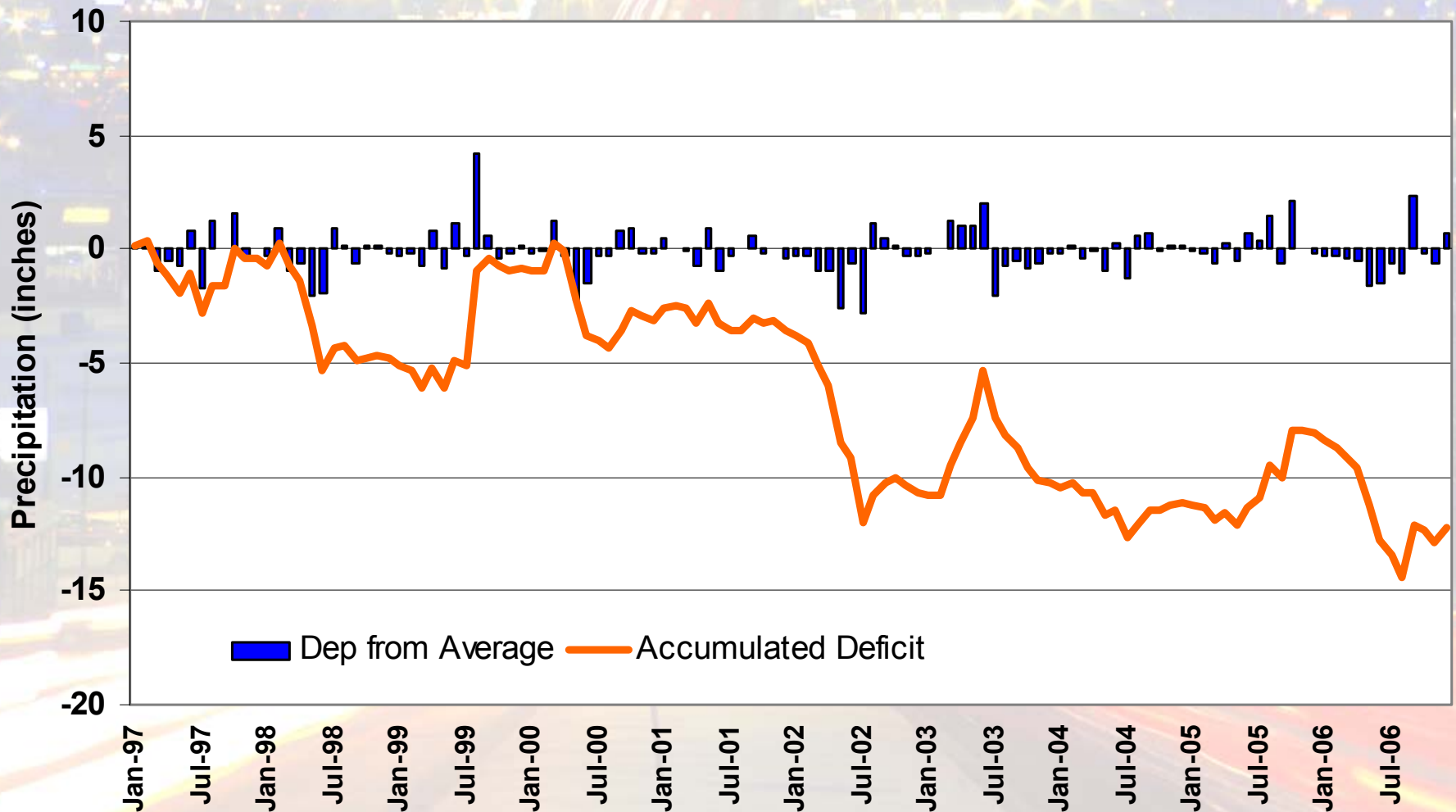
Greeley Monthly Precipitation Departures from Average

Greeley Precipitation Deficits



Akron Monthly Precipitation Departures from Average

Akron Accumulated Precipitation Deficit

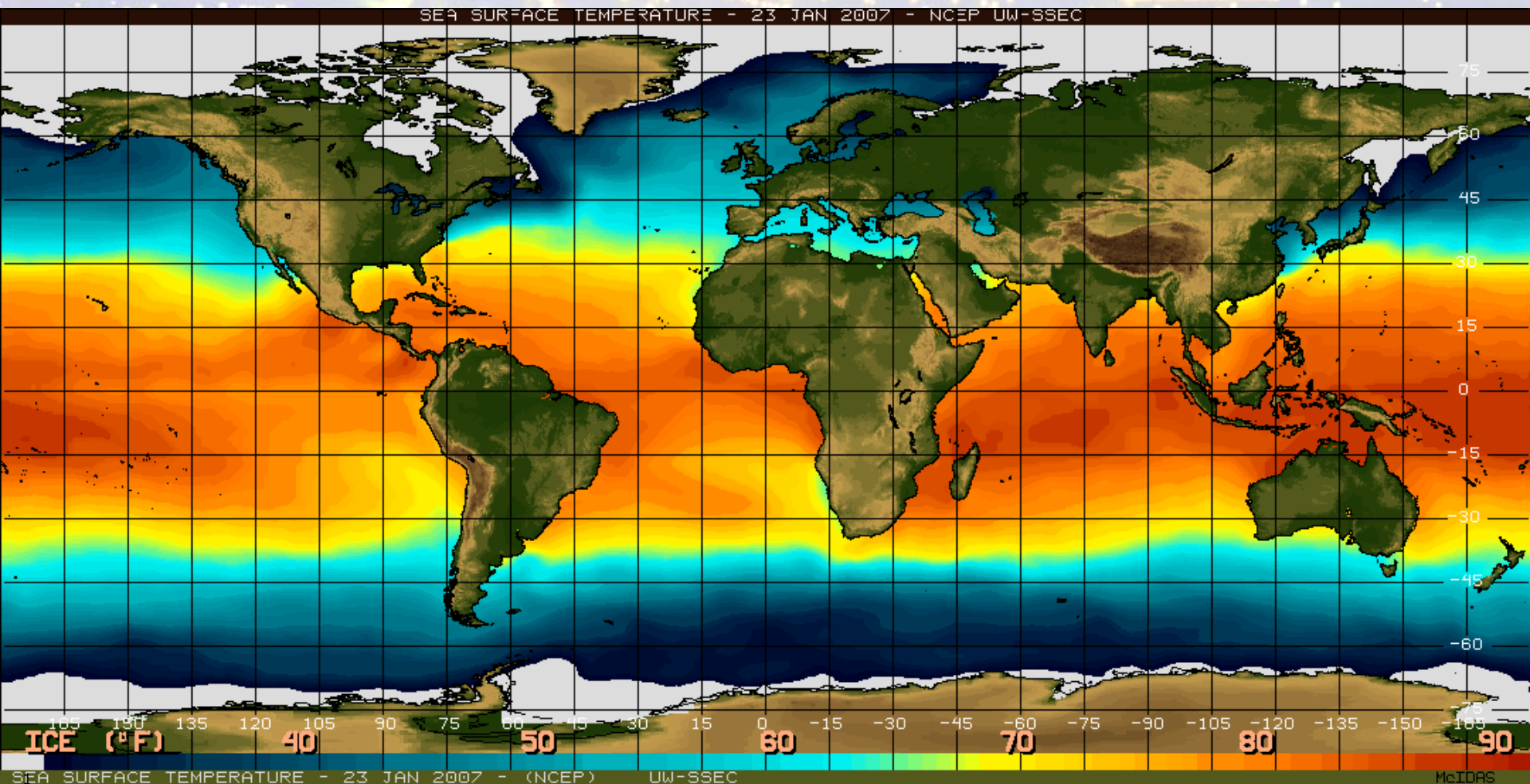


A photograph of a residential neighborhood in winter. In the foreground, a car is almost entirely buried under a thick, smooth layer of snow, with only its side mirror and a portion of its rear visible. In the background, a red brick house with a snow-covered roof is visible. To the right, an American flag flies on a pole. Bare trees and evergreens are scattered throughout the scene under a grey, overcast sky.

Great!
So Now What?

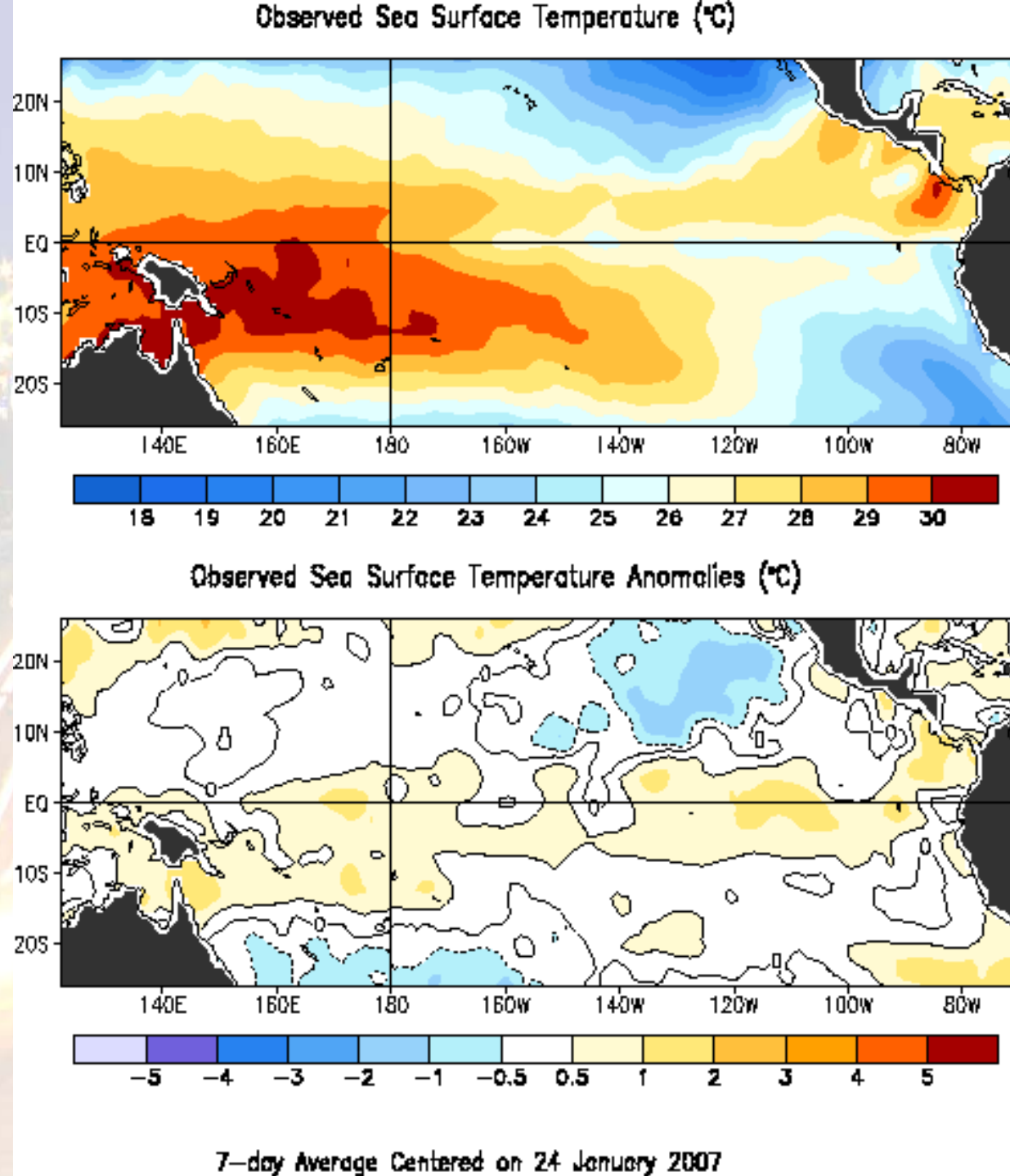
Photo by M. Wallace, CoCoRaHS observer

Sea Surface Temperature (SST)

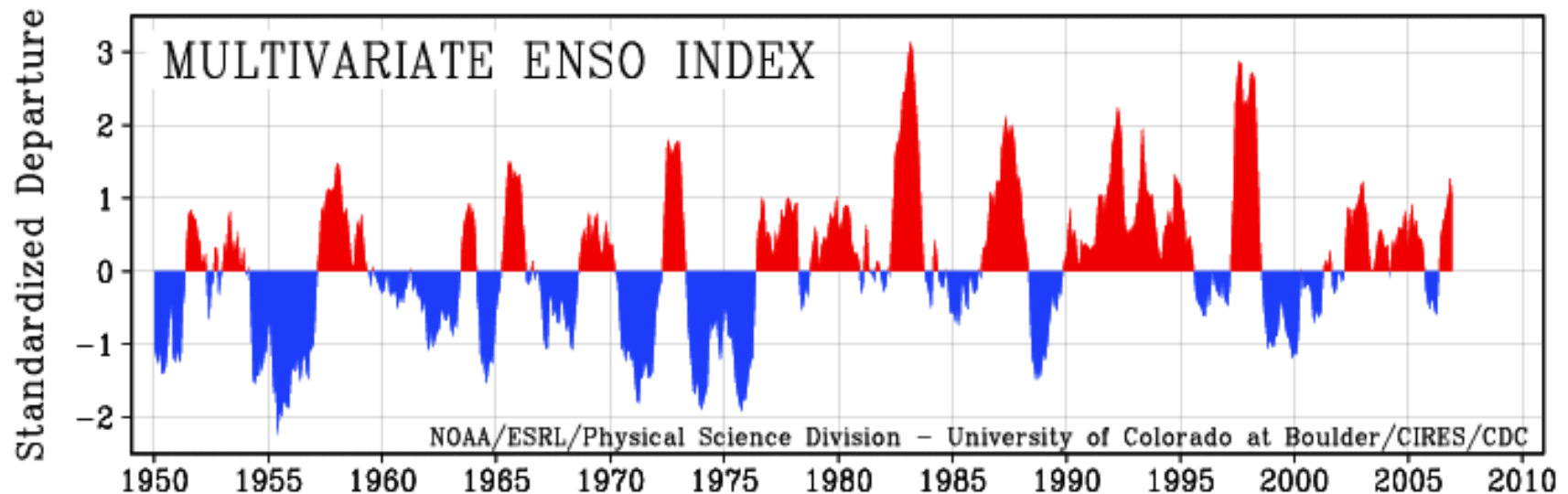
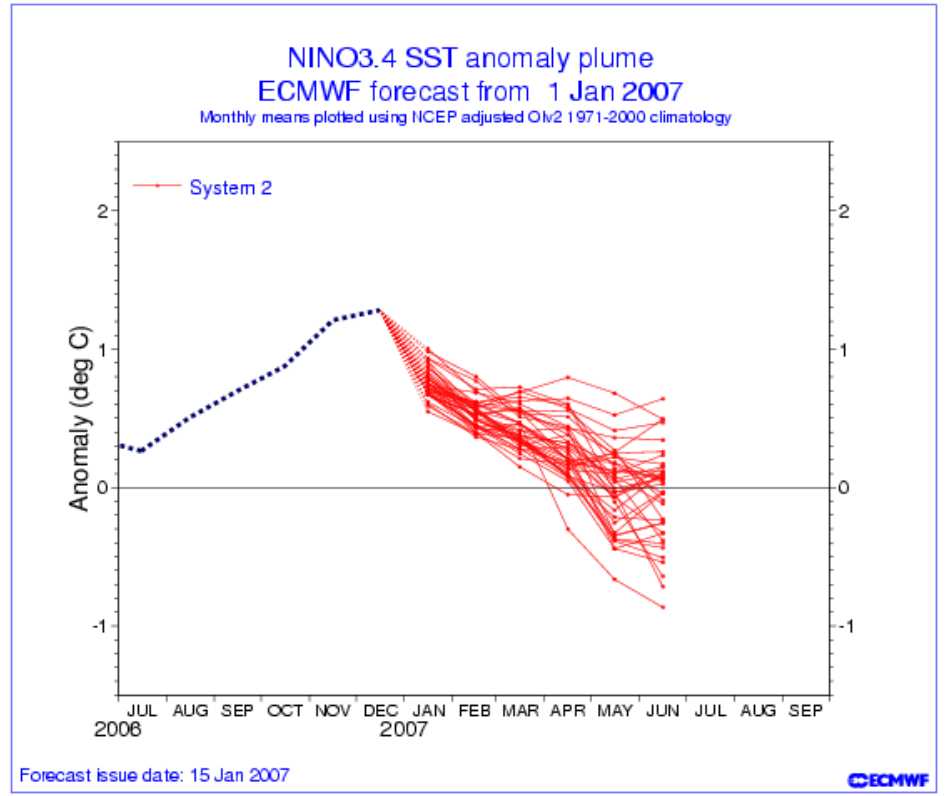


<http://www.ssec.wisc.edu/data/sst.html>

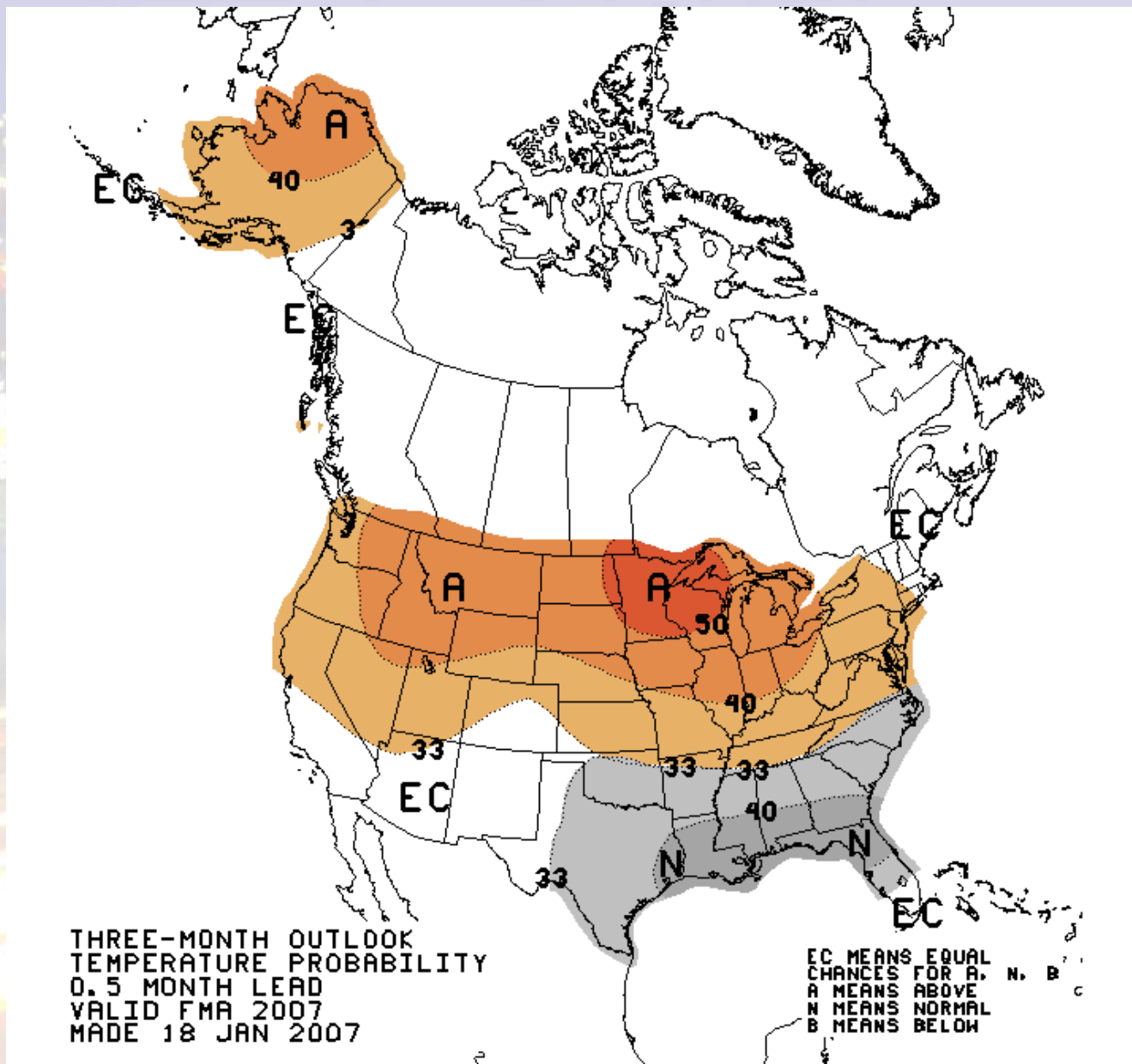
Sea Surface Temperature (SST) Departure from Average



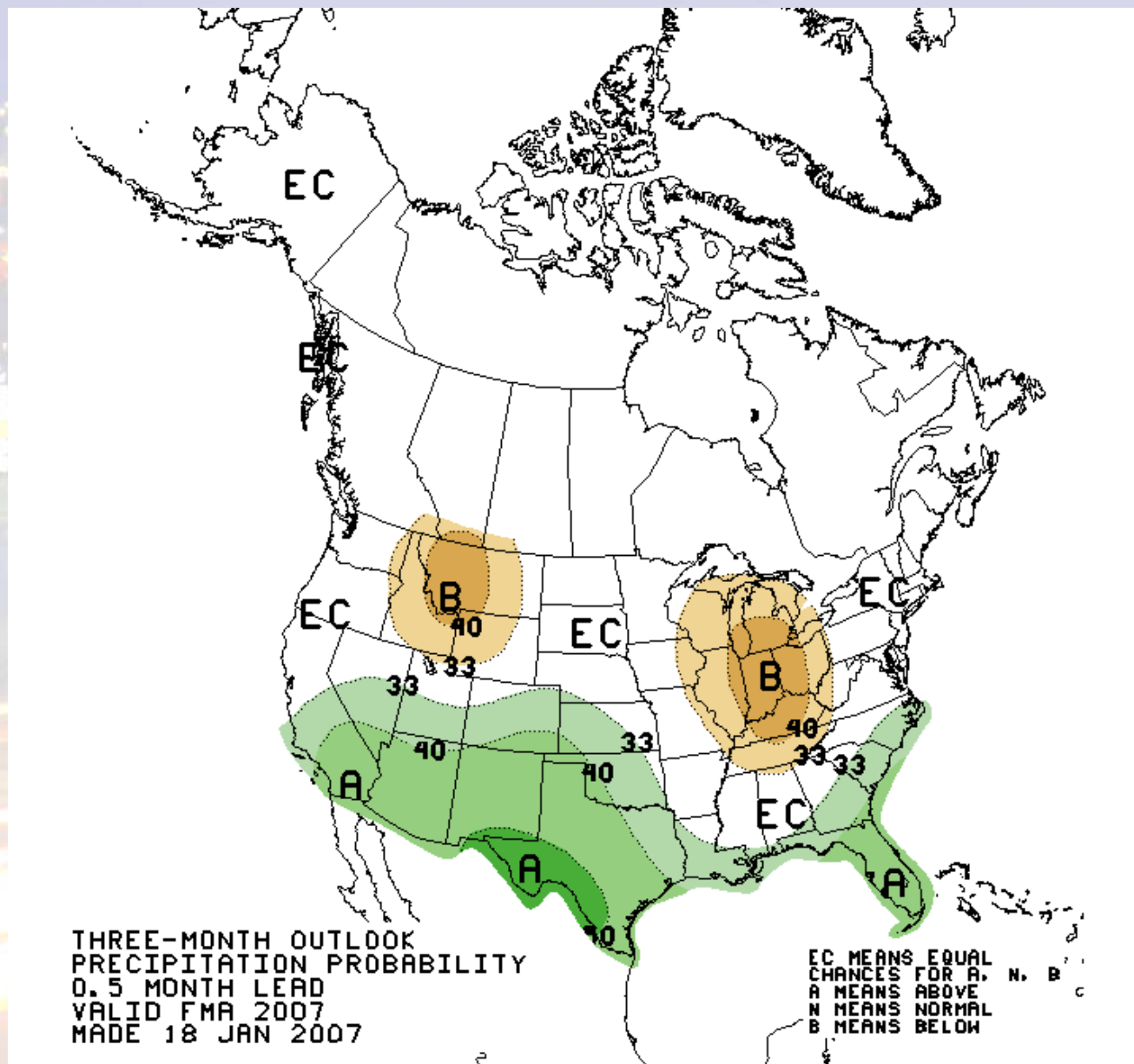
El Nino Status and Projections



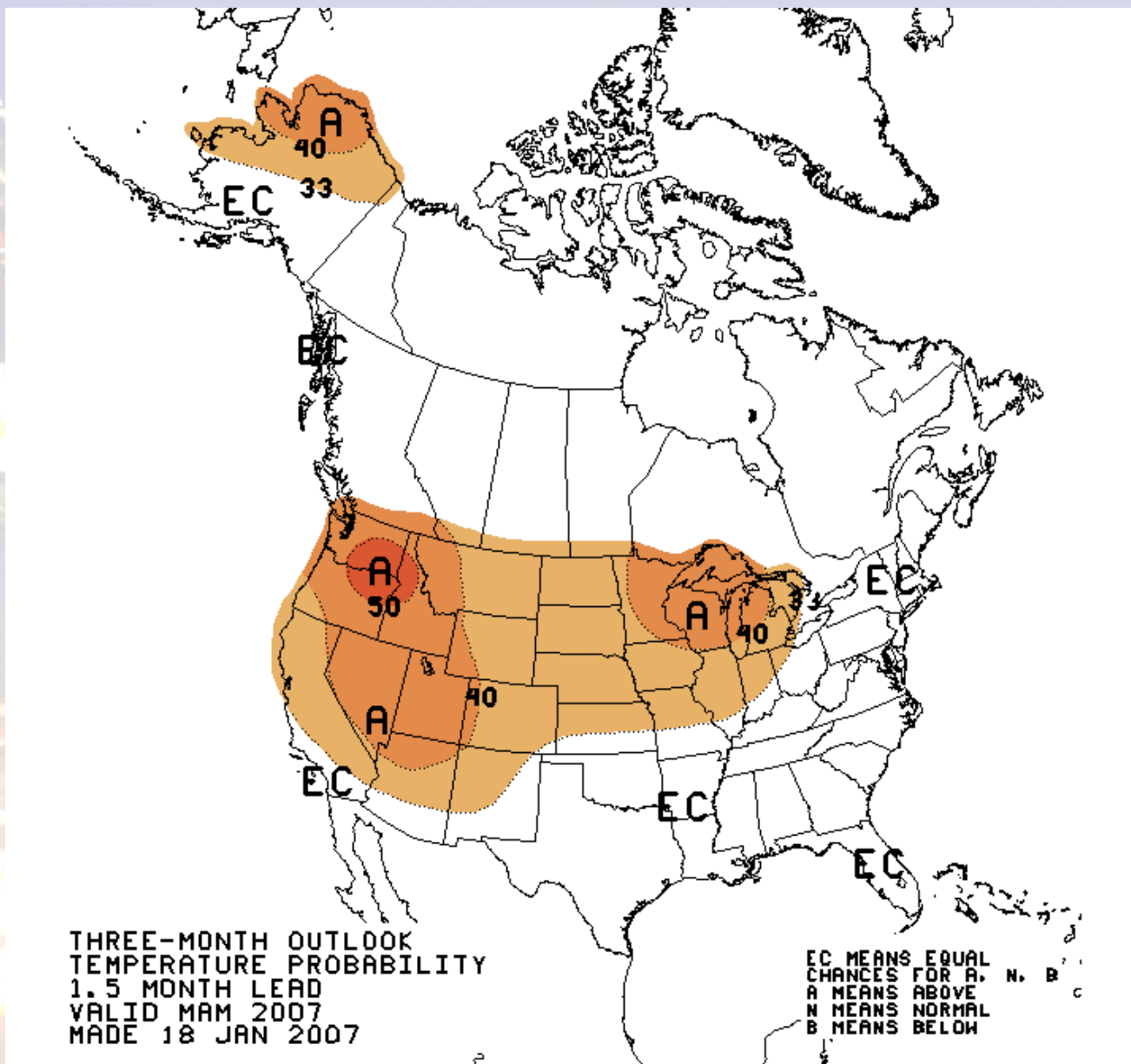
Feb-Apr Temperature



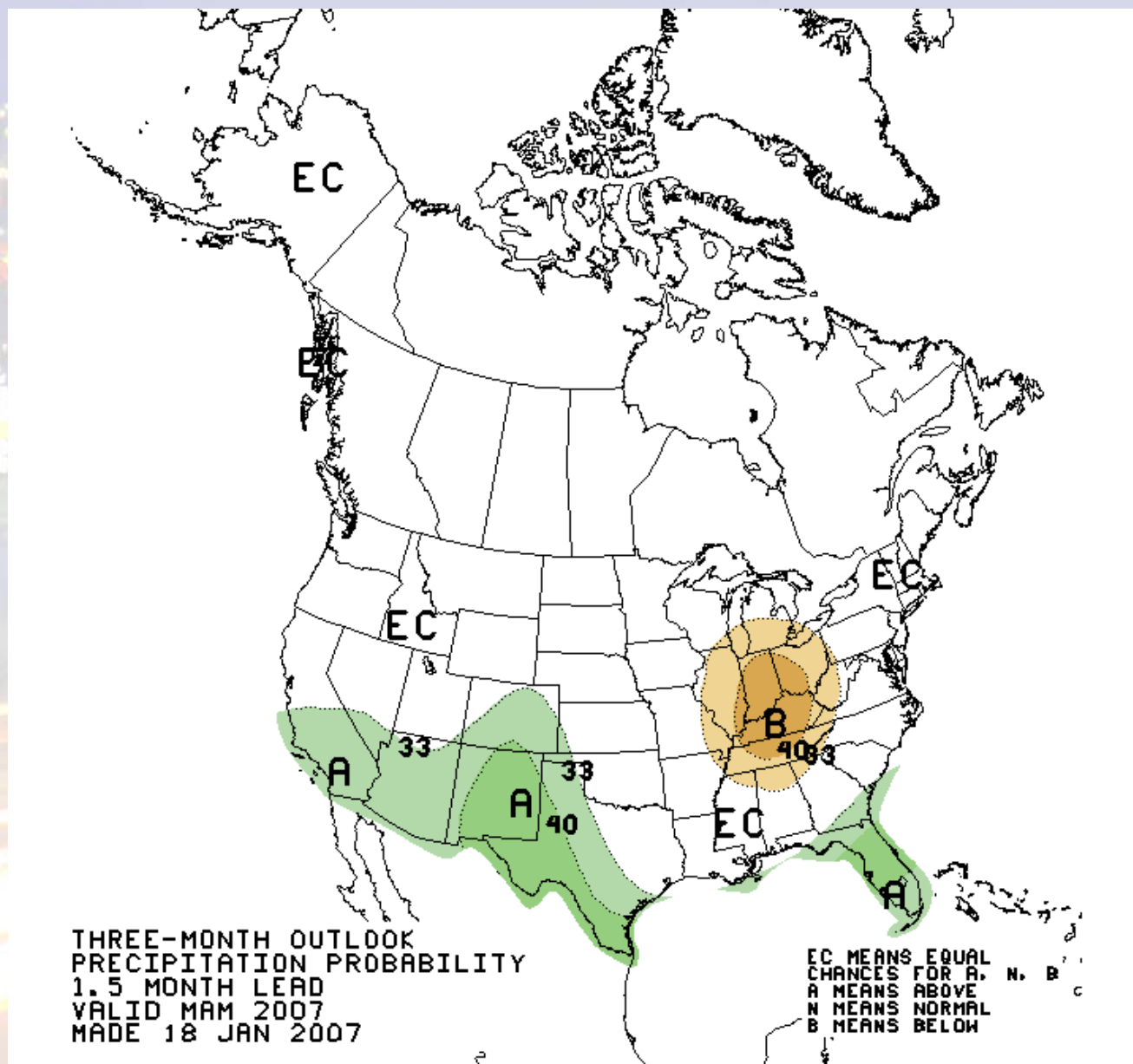
Feb-Apr Precipitation



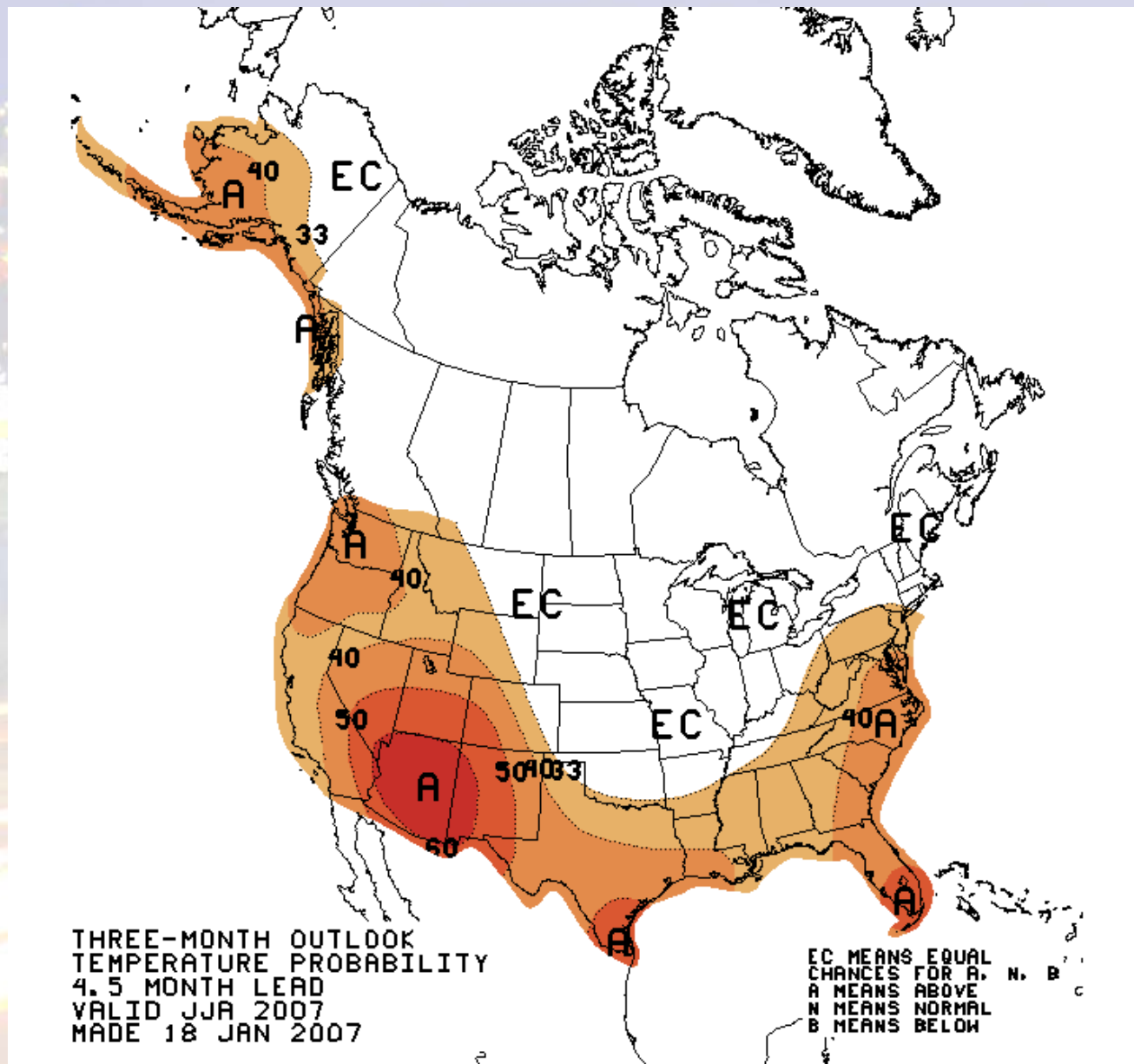
Mar-May Temperature



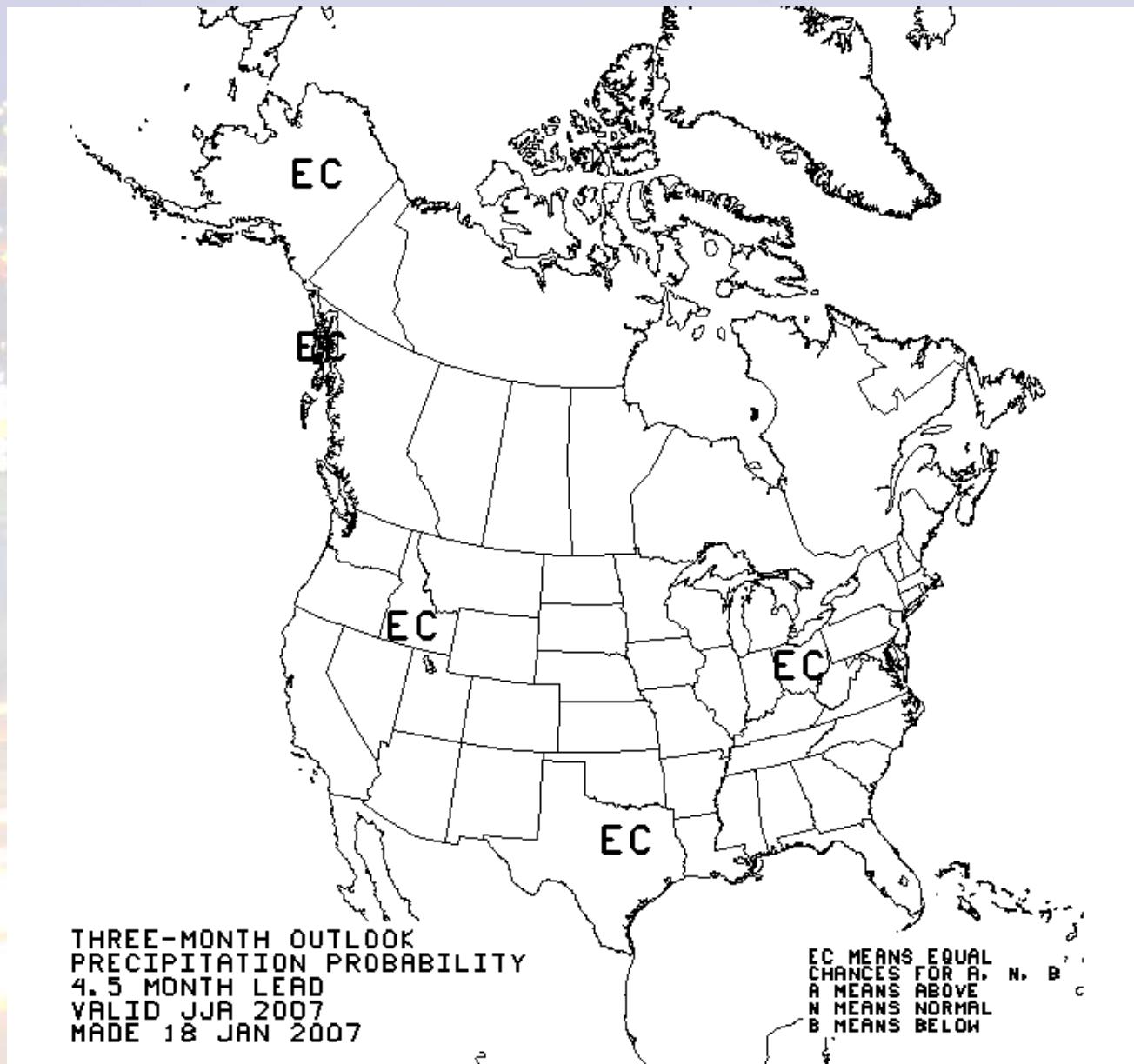
Mar-May Precipitation



Jun-Aug Temperatures



Jun-Aug Precipitation



**We may not know for certain
what lies ahead, but we know it
will be interesting!**

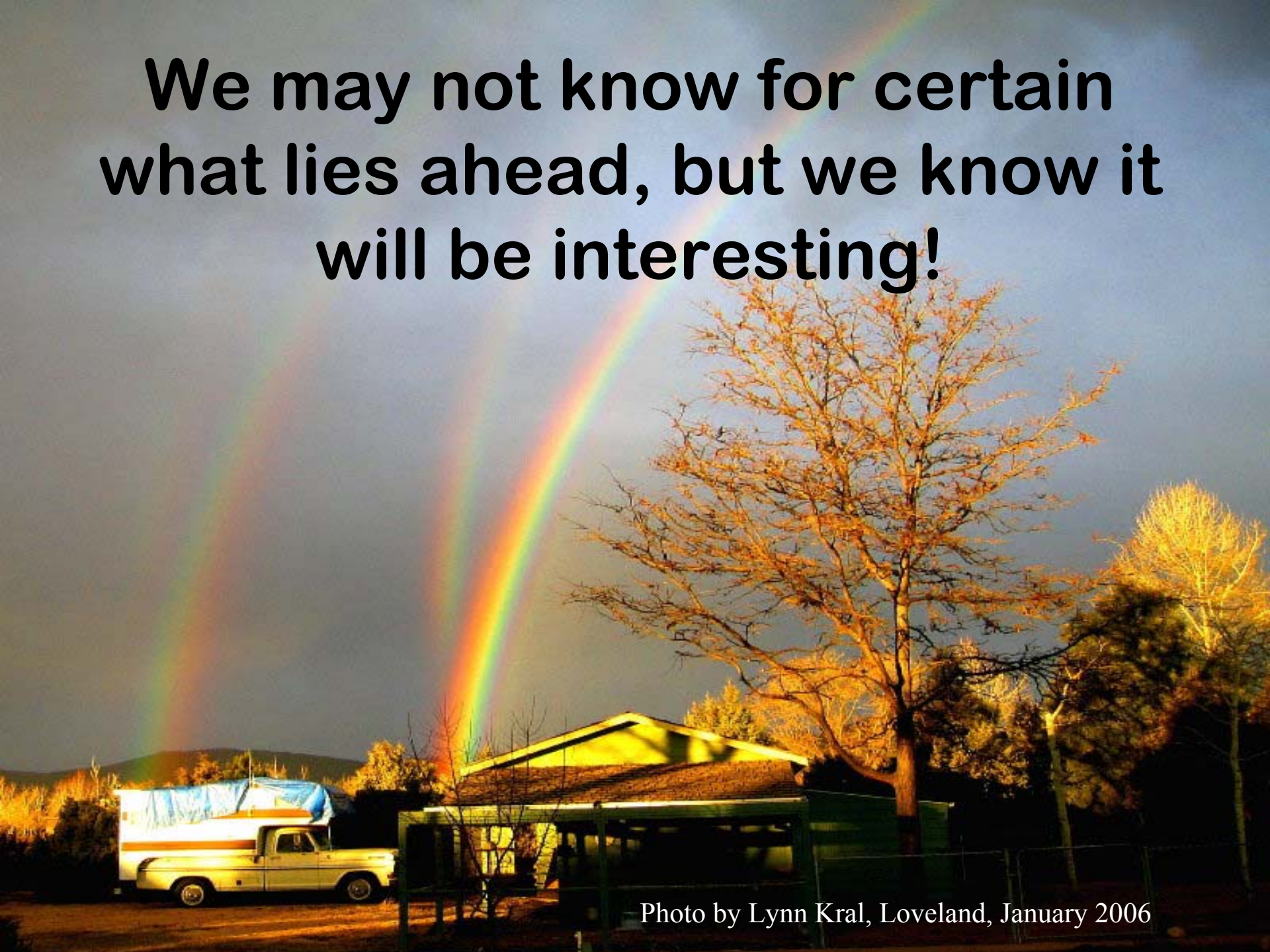


Photo by Lynn Kral, Loveland, January 2006

Some data sources you may be interested in



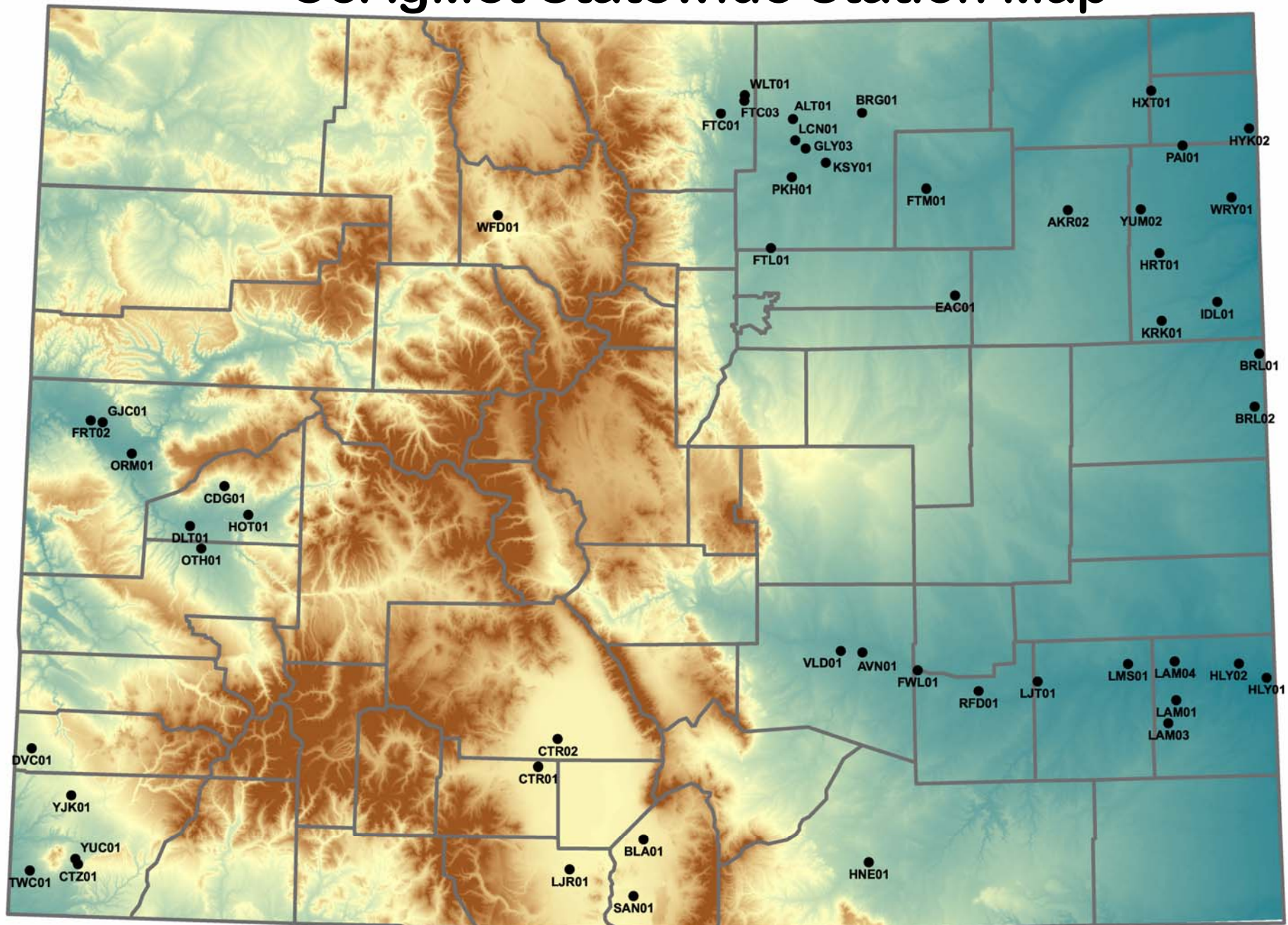
Photo by Wendy Ryan

Colorado Agricultural Meteorological (CoAgMET) Network

Kersey site, photo by Harold Duke

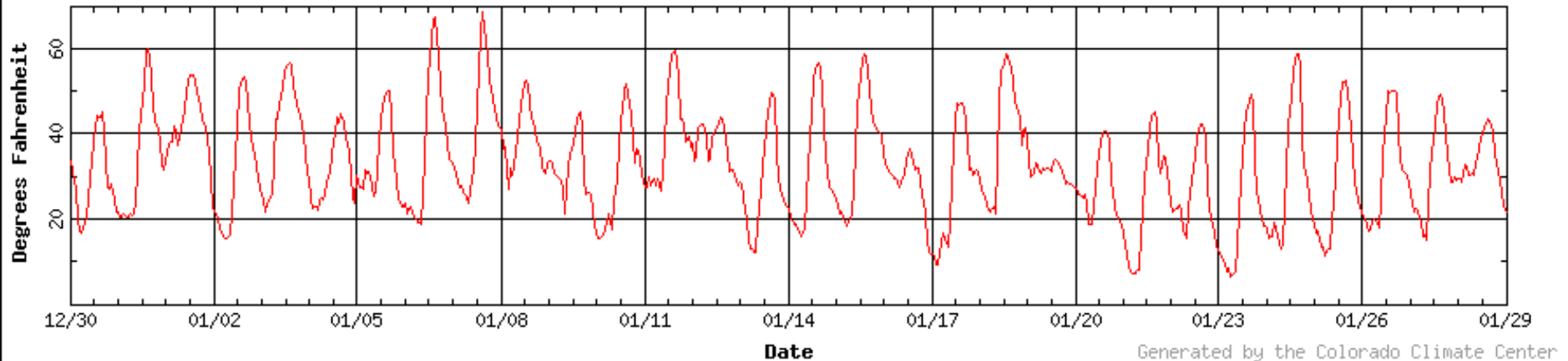
<http://www.coagmet.com>

CoAgMet Statewide Station Map

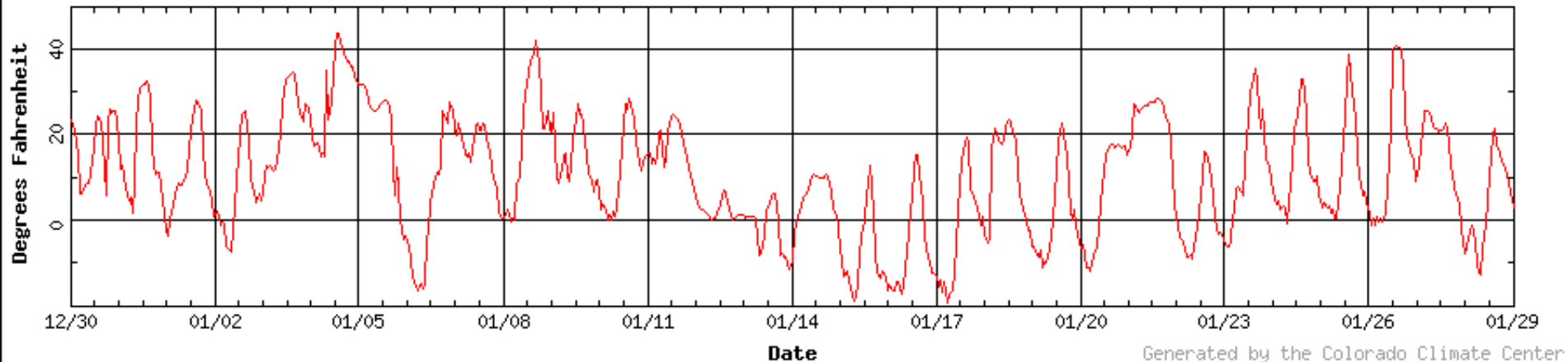


Kersey CoAgMet Temperature

Dec 05 – Jan 2006 Temperature for KSY01 (12-30-2005 - 01-29-2006)



Dec 06 – Jan 2007 Temperature for KSY01 (12-30-2006 - 01-29-2007)



National Weather Service (NWS)

weather.gov

National Oceanic and Atmospheric Administration's

National Weather Service

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Local forecast by "City, St" City, St

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Warnings
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Surface Weather...
Observed Precip

Forecasts
Local
Graphical
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Severe Weather
Fire Weather

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Forecast Models
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Statistical Models...

Climate
Past Weather
Predictions

Weather Safety
Weather Radio
Hazard Assmt...
StormReady /
TsunamiReady

Education/Outreach

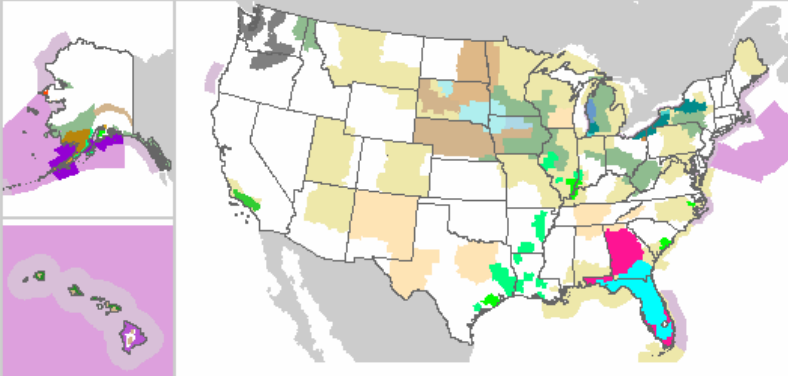
...National Weather Service Severe Weather Warnings To Provide More Precise Location...

This fall the National Weather Service will introduce storm-based warnings for tornadoes, severe thunderstorms, flash floods and marine hazards that are more geographically specific for these short-duration weather events. Currently, such warnings are issued county wide.

[Details...](#)

Warnings & Forecasts Graphical Forecasts National Maps Radar Rivers Air Quality Satellite Climate

Warnings By State Click Below To Zoom In. Tabs At A Glance



American Samoa • Guam • Puerto Rico/Virgin Islands

Blizzard Warning	Snow Advisory	Wind Advisory
Storm Warning	Winter Weather Advisory	Air Stagnation Advisory
High Surf Warning	Lake Effect Snow Advisory	Lake Effect Snow Watch
Flood Warning	Wind Chill Advisory	High Wind Watch
High Wind Warning	High Surf Advisory	Fire Weather Watch
Lake Effect Snow Warning	Heavy Freezing Spray Warning	Flood Statement
Freeze Warning	Blowing Snow Advisory	Special Weather Statement
Flash Flood Watch	Small Craft Advisory	Short Term Forecast
Gale Warning	Brisk Wind Advisory	Hazardous Weather Outlook
Red Flag Warning	Frost Advisory	

www.nws.noaa.gov

Community Collaborative Rain, Hail and Snow (CoCoRaHS) Network



www.cocorahs.org

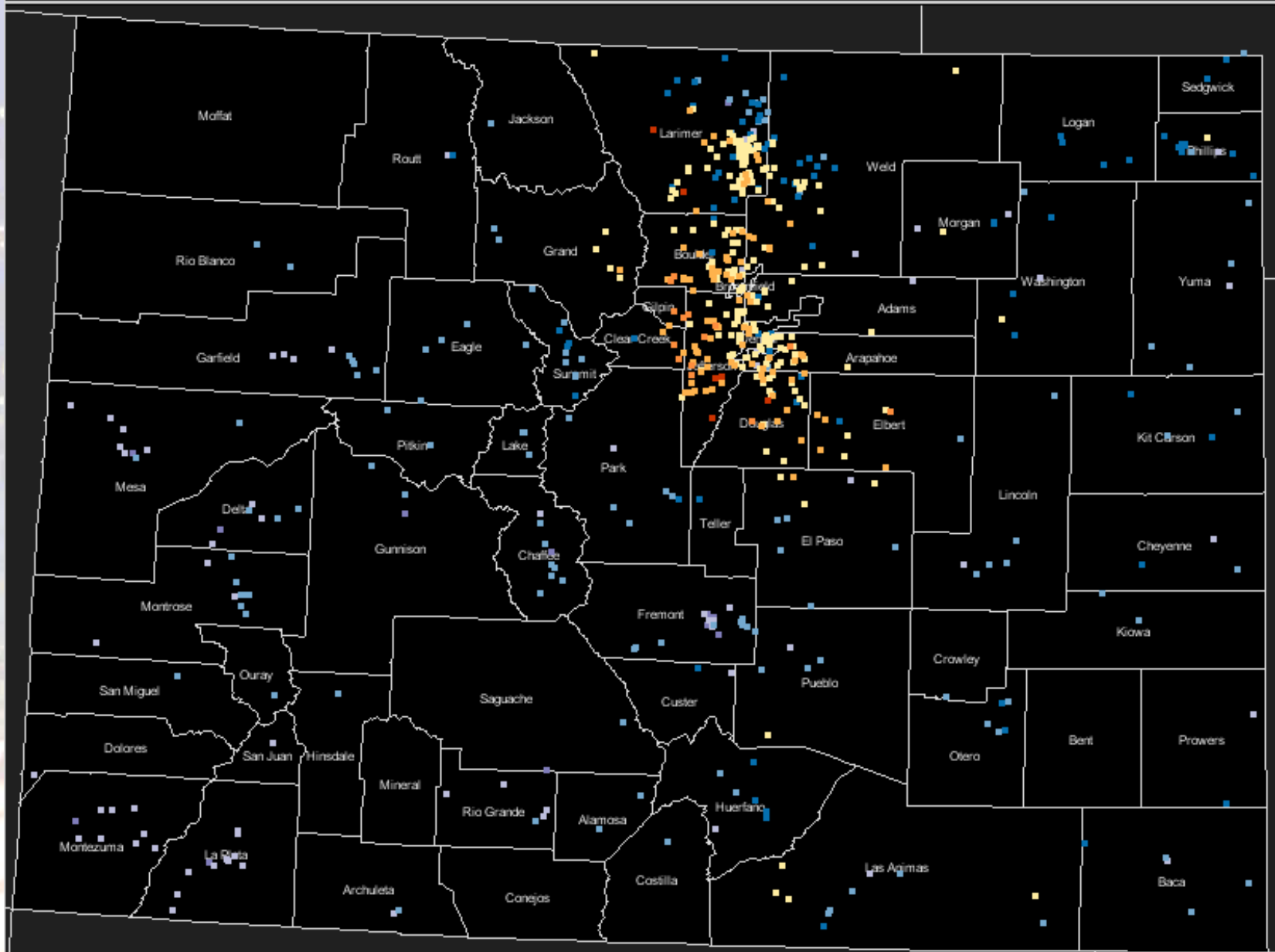
Photo by H. Reges

CoCoRaHS snowfall map, Dec 21, 2006 Colorado Statewide

Daily Snow (inches x.x), for the 24 hour period ending ~7:00 am

Colorado 12/21/2006

0.0 Trace 0.0 - 8.0 8.0 - 16.0 16.0 - 24.0 24.0 - 32.0 32.0 - 40.0 40.0 - 48.0



And you can help too!



Photo by H. Reges

**If you are a chronic
weather watcher or
water worrier (or
warrior) and you
aren't already a
part of CoCoRaHS,
please see me at
the break.**



For More Information, Visit the CoCoRaHS Web Site



<http://www.cocorahs.org>

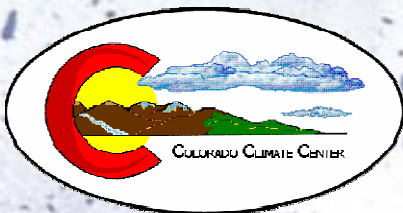


Support for this project provided by
NSF Informal Science Education Program,
NOAA Environmental Literacy Program
and
many local charter sponsors.

Colorado Climate Center

Data and Power Point Presentations
available for downloading

<http://ccc.atmos.colostate.edu>



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